Aquatic Enhancement
& Survey, Inc.

Lake Pleasant Aquatic Vegetation Management Plan Update, Steuben County, Indiana 2006

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December 3, 2006

Acknowledgements

I would like to thank the following persons for contributing time and resources necessary to the preparation of this update. Larry and Nancy Bandelier, Al Dennison, Neil Ledet and Larry Koza of the Indiana Department of Natural Resources, Division of Fish and Wildlife, Fisheries Section, Gwen White and Angela Sturdevant of the Indiana Department of Natural Resources, Division of Fish and Wildlife, Lake and River Enhancement Program, Mitchell S. Alix, Ph.D. of the Biology/Chemistry Department, Purdue University North Central, Earl Chilton of the Texas Parks and Wildlife Department, Dr**.** John H. Rodgers, Jr., Rob Nelson at ExploreBiodiversity.com, and Sally Abella of King County Natural Resources and Parks, Water and Land Resources Division.

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Executive Summary

Lake Pleasant is a 417 acre oligotrophic glacial lake in Steuben County Indiana. It has a relatively small watershed of 1768 acres comprised largely of agricultural lands. The lake is ringed by a mix of riparian marshland and uplands developed with homes and cottages. Lake Pleasant has several developed excavated channels along its south edge. The lake has a unique and diverse aquatic floral community with at least 22 species of submersed aquatic plants including two rare species and one threatened species. (See the complete plant inventory below)

Common Name(s)	**Scientific Name**	**Species Code**	**Nativity Native/Introduced**	Indiana Status (Rare/Threatened/Endangered)
Whorled watermilfoil	*Myriophyllum verticillatum*	MYVE	N	Rare
Northern watermilfoil, Shortspike watermilfoil, Common watermilfoil	*Myriophyllum sibiricum*	MYSI	N	
Variable pondweed	*Potamogeton gramineus*	POGR	N	
Chara, Muskgrass, Stonewort	*Chara* sp.	CH?AR	N	
Flatstem pondweed	*Potamogeton zosteriformis*	POZO	N	
Longleaf pondweed, American pondweed	*Potamogeton nodosus* (formerly *P. americanus*)	PONO2	N	
Whitestem pondweed	*Potamogeton praelongus*	POPR5	N	Threatened
Eurasian watermilfoil	*Myriophyllum spicatum*	*MYSP2	I	
Richardson's pondweed	*Potamogeton richardsonii*	PORI	N	Rare
Illinois pondweed	*Potamogeton illinoensis*	POIL	N	
Curlyleaf pondweed	*Potamogeton crispus*	*POCR3	I	
Sago pondweed	*Potamogeton pectinatus*	POPE6	N	
Elodea, Common waterweed	*Elodea canidensis*	ELCA	N	
Horned pondweed	*Zannichellia palustris*	ZAPA	N	
Largeleaf pondweed	*Potamogeton amplifolius*	POAM	N	
Vallisneria, Tapegrass, Eelgrass, Wild celery	*Vallisneria americana*	VAAM	N	
Small pondweed	*Potamogeton pusillus*	POPU	N	
Leafy pondweed	*Potamogeton foliosus*	POFO3	N	
Coontail	*Ceratophyllum demersum*	CEDE	N	
Great bladderwort, Common bladderwort	*Utricularia vulgaris*	UTMA	N	
Floatingleaf pondweed	*Potamogeton natans*	PONA	N	
Water stargrass	*Zosterella dubia, Heteranthera dubia*	ZODU/HEDU	N	
Common Duckweed	*Lemna minor*	LEMI3	N	
Arrowhead (submersed)	*Sagittaria* sp.	SA sp.	N	
Filamentous algae	Any species	ALGA	N	
White water-cup (rigid white water buttercup), White water crowsfoot	*Ranunculus longirostris (incl. R. trichophylus)*	RALO2	N	
Brittle naiad	*Najas minor*	NAMI	I	
Common naiad, Slender naiad	*Najas flexilis*	NAFL	N	
Spiny naiad	*Najas marina*	NAMA	N	

Table 1 Lake Pleasant plant inventory

The lake supports a good fishery showing some of the highest growth rates for Redear sunfish in Steuben County. Lake Pleasant users have become increasingly concerned in recent years about an increase in the growth of Eurasian watermilfoil, an invasive, non-

native aquatic plant. Curlyleaf pondweed, also a potentially invasive plant, is present, but not currently causing significant problems. The excessive growth of Eurasian milfoil has caused ecological and recreational-use problems in channels, shoreline areas, and some offshore areas of the lake. To help address this issue the *Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010* (Aquatic Enhancement & Survey, Inc. 2005) has been developed though cost-share funding provided by the Indiana Department of Natural Resources Lake and River Enhancement Program (LARE) and the Lake Pleasant Cottage Association Owners, Inc. The purpose of the plan is to provide guidance to the Lake Pleasant Cottage Owners and the Indiana Department of Natural Resources for managing the lakes plant community to protect the ecological integrity and recreational and aesthetic value of the lake. The plan contains the following primary goals:

Goal 1. • Maintain a stable, diverse aquatic plant community that supports a good balance of predator and prey fish and wildlife species, good water quality and is resistant to minor habitat disturbances and invasive species.

Goal 2. • Direct efforts to preventing and/or controlling the negative impacts of aquatic invasive species.

Goal 3. • Provide reasonable public recreational access while minimizing the negative impacts on plant, fish, and wildlife resources.

This update summarizes plant management activities in 2006 and characterizes the lake's plant community and the lake-user response to management activities in 2006 under the plan. It provides a proposed course for future management that is consistent with the original plan goals. Tier I Aquatic Plant Data and milfoil location data were collected on Lake Pleasant on May 19, 20 and 23, 2006. 16 species of rooted submersed aquatic plants were noted in the Tier I survey showing good diversity. As estimated the previous season, approximately 25 surface acres of Lake Pleasant contained a significant growth of Eurasian watermilfoil. Per the lake's plant management plan 2, 4-D granular systemic aquatic herbicide was applied to these areas of the lake at the rate of 100 pounds per surface acre. The treatment was performed on June 1st during good weather conditions with a surface water temperature of 77.4 degrees Fahrenheit. The treatment area totaled approximately 25 surface acres and included all the channels on the lake's south side and several offshore areas in the open lake. Larger offshore areas and many small concentrated dense offshore milfoil colonies were spot treated using GPS coordinates obtained in May when water clarity was excellent and the plants could be easily located. Post treatment Tier I and Tier II Plant Surveys were performed on August 15th. 20 species of submersed aquatic plants and one free-floating species were identified. Little Eurasian watermilfoil was found. Eurasian milfoil plants were only seen in three channels on the lake's south shore and one shoreline area (all previously treated). Dense Eurasian watermilfoil growth was limited to one narrow channel in the southeast corner of the lake and occupied less than one third of an acre. Another visit was made to the lake on September 15th to spot check offshore treatment areas in the improved fall water clarity. Despite considerable effort, not a single Eurasian watermilfoil plant was seen or collected outside the channel areas. Spot checks were

made of every treated milfoil colony and offshore treatment area using visual checks, sonar, and rake tosses but no milfoil was found. Milfoil plants collected in Redwater Lake in 2006, a basin connected to the northwest corner of the lake, were initially thought to be Eurasian watermilfoil but were identified by botanists at Purdue University North Central as the native milfoils Whorled watermilfoil *Myriophyllum verticillatum* and Northern watermilfoil *Myriophyllum sibiricum*. Lake Pleasant's native plant community did well in 2006 when compared with many other Indiana lakes but statistically was down in diversity slightly in comparison with the 2005 season. Much of this may be due to a slight change in LARE sampling protocols, but some of the change appears to be due to a slight decrease in late season water clarity. Native pondweeds were still fairly abundant in the treatment areas with Illinois pondweed and Richardson's pondweed commonly replacing treated Eurasian watermilfoil but Spiny naiad also became abundant in an offshore plantbed that was treated for Eurasian watermilfoil. This was the first time this plant appeared to be dominant in this area. Based on the survey data this plant appears to be a light scavenger, perhaps having taken advantage of slightly reduced water clarity in the 2006 season (seven foot August Secchi depth versus 11.3 feet in 2005) to colonize areas that previously were dominated by other plants. Spiny naiad did not compete well with other plants within the 0-5.9 foot contours, occurring at only 5.88% of sites. Between the 6 and 10.9 foot contours where diversity and plant growth is very vigorous on Lake Pleasant it became more prominent being found at 44.44% of sites, but was still overshadowed by Illinois pondweed (55.56%) and rivaled by Common naiad (also 44.44%). Between the 11 and 15.9 foot contour it was most abundant (except for Chara) occurring at 35.29 percent of sites. Plants like Vallisneria, and Illinois pondweed may have born the brunt of turbidity induced growth reduction with a low-meadow type of plant such as Spiny naiad taking advantage of their absence and increasing its growth.. Because it does not compete well at the shallower depths and grows in primarily a low-meadow configuration it did not present a problem for residents in swimming or boating areas. Lake Pleasant probably has the seed bank present in the hydrosoil to rebound repeatedly, displaying excellent growth of important native species in seasons of good water clarity, but if water quality is not protected this ability could no doubt diminish. This accentuates the fact that good water clarity is closely linked to diversity and habitat and stresses that nutrient and turbidity management will always be part of the lake's aquatic plant management. *Myriophyllum verticillatum*, a native milfoil common in and around the channels on the lake's south side was largely eliminated for the season in the treatment areas along with the Eurasian watermilfoil. This plant was a non-target species of concern although it does occasionally grow to nuisance levels in Lake Pleasant's channels. The confirmation of the presence of this plant in Redwater Lake indicates that a refuge exists for it as long as the spread of Eurasian watermilfoil (and the subsequent need for treatment)to Redwater Lake is prevented. Based on excellent treatment results in 2006 the Lake Pleasant Cottage Owners Association, Inc. should repeat the use of 2,4-D granular in affected areas in 2007. With near-complete control in 2006 it is unlikely that the acreage of dense Eurasian milfoil growth in Lake Pleasant will exceed 25 acres in 2007. It is possible regrowth in treatment areas in future seasons may exceed that noted in 2006 so a possible re-treatment should be planned pending results of the 2007 post treatment surveys. Because dramatic treatment results were noted in 2006, the prospects for containing Eurasian watermilfoil problems and protecting the recreational

and ecological integrity of Lake Pleasant are good but it will not be known whether the excellent treatment results in 2006 will decrease colonization overall until the 2007 season surveys begin. Eurasian milfoil sometimes returns in a similar pattern of colonization after localized systemic herbicide treatments. Because very little Eurasian watermilfoil was left in Lake Pleasant at the end of the 2006, extensive 2007 season returning growth in treated areas would presumably be due to intact subsurface root structures that survived the treatment. To avoid the possible development of resistance to treatment a switch to another granular systemic herbicide in alternate years may be advisable if such a product should achieve EPA licensing, become available to the aquatic market, and prove efficacious.

1.0 Introduction

Lake Pleasant has been treated for nuisance aquatic plants for several years. Prior to 2004 treatments were limited to the excavated channels on the lake's south shore and associated dredged shorelines near the channel mouths. These treatments targeted both nuisance growths of native aquatic plants and the exotic invasive plant Eurasian watermilfoil. Treatments also targeted the exotic plant Curlyleaf pondweed in some channel areas. Residents began to notice more Eurasian milfoil growing in offshore areas of the open lake and began to treat these areas in 2004. In 2005 the LARE program began to help the Lake Pleasant Cottage Owners develop and implement a comprehensive lake-wide program to asses and combat the increasing Eurasian watermilfoil problem with a 25 acre systemic (2,4-D) treatment including all affected areas. The table below outlines Lake Pleasant's plant management history since 2004.

Year	**Action**	**Action**	**Action**	**Funding**	Results

	Taken	Taken	Taken	Source	
7/2004	Basic Plant Survey	Appr. 7 Acres of channels treated for Eurasian watermilfoil and native plants (contact and systemic herbicides) 7/04	8 acres of offshore lake areas treated for Eurasian watermilfoil (Reward contact herbicide)	LPCOA and Manapogo Park Campground and Marina	Very good MYSP control. Rebound by native pondweeds in treatment areas
7/2005	Tier I and Tier II Surveys and Plant Plan Development	Appr. 7 Acres of channels treated for Eurasian watermilfoil and native plants, (Reward contact herbicide) 7/05	11 acres of offshore lake areas treated for Eurasian watermilfoil (Reward contact herbicide)	LPCOA and Manapogo Park Campground and Marina (treatment) LPCOA and LARE (plant development)	Extensive regrowth in many MYSP treatment areas
2006	Tier I and Tier II Surveys and Plant Plan update	Appr. 11 Acres of channels and shoreline areas treated for Eurasian watermilfoil (2,4-D granular) 6/1/06	14 acres of offshore lake areas treated for Eurasian watermilfoil (2,4-D granular)	LPCOA and LARE	Excellent results in MYSP treatment areas .3 acres of re-growth in SE channel

Table 2 Lake Pleasants recent plant management history

2.0 Watershed and Lake Characteristics

There have been no significant changes in the current year.
See Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010 (Aquatic Enhancement 2006)

3.0 Lake Uses

There have been no significant changes in the current year.
See Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010 (Aquatic Enhancement 2006)

4.0 Fisheries

There have been no significant changes in the current year.
See Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010 (Aquatic Enhancement 2006)

5.0 Problem Statement

There have been no significant changes in the current year.

See Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010 (Aquatic Enhancement 2006)

6.0 Vegetation Management Goals and Objectives

There have been no significant changes in the current year.
See Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010 (Aquatic Enhancement 2006)

7.0 Plant Management History, 2006 Season Management Actions

Eurasian watermilfoil was targeted for treatment on a lake-wide basis on Lake Pleasant in 2006. Patterns of colonization of this invasive plant vary, but often Eurasian watermilfoil forms dense colonies nearly exclude the growth of other plants by forming light-blocking overgrowth early in the season before native plant propogules spring into action. Prior to the year 2000 Eurasian milfoil was not prominent outside the channels and associated dredged shoreline areas on the lake's south side. In the past five years dense colonies have started to pop up in several offshore areas of the open lake. Lake Pleasant like all lakes has its plant community shaped largely by the distribution of soil particle sizes and organic matter in its sediments with sorting occurring by wind and boat-wake driven water movement. Relatively light organic materials and fine fertile silts are continually re-suspended and exported from shallow open-lake areas by the action of the waves, eventually settling out in the tranquility of deeper waters, channels, and protected backwater areas such as Redwater Lake. Channels are prime candidates for supporting plant growth as they collect organic fertility from vegetation along their extensive riparian interface and also receive nutrient input from lawns, leaf litter, and septic sources. The secondary colonization has occurred in shoreline areas that have been artificially deepened through dredging to allow for better navigation. When most of Lake Pleasant's channels were dredged, adjacent shoreline areas were also deepened. Being close to shore they area exposed to many of the same nutrient/sediment sources as the channels, while being slightly deeper and less prone to the export of these materials by water movement. As a consequence they offer settling points for fertility. Finally, offshore areas of the open lake that offer enough depth to settle suspended fertile particulates, yet are shallow enough to provide sufficient amounts of ambient light at the hydrosoil were colonized. This third tier of colonization began occurring on Lake Pleasant to a noticeable extent within the last five years. Plant fragments originating from the lakes channels and dredged shorelines are probably transported by boats and wind, settling out in these fertile offshore areas of the large littoral shelf at the east end of the lake and a smaller fertile littoral shelf near the west end of the lake. Along areas of sharp contour breaks colonies have also formed along the weedline. Areas of offshore colonization are most commonly located between the five and ten foot depth contour on Lake Pleasant. Unfortunately these are the same areas colonized by beneficial native species so damage to the native plant community can be expected as the process continues. To stem or reverse this process 25 acres of dense Eurasian watermilfoil growth were located, GPS marked and treated in 2006 with Navigate® granular 2, 4-D. Whereas 2, 4-D shows a highly selective toxicity for broadleaf plants, the class of plants to which Eurasian watermilfoil belongs, damage to most native plants is minimal or negligible. Because channels and infested shoreline areas are probably the primary source of infecting plant fragments on Lake Pleasant, any of these areas with even a

minimal colonization by Eurasian watermilfoil was treated completely. To maximize offshore treatment efficacy small dense colonies, separated from other milfoil plants by considerable distances were marked and spot treated separately. They are denoted by a "+" on the treatment/milfoil map below (figure 1). Small colonies located in clusters or larger areas of colonization in the open lake were treated with broader treatments to insure complete coverage.

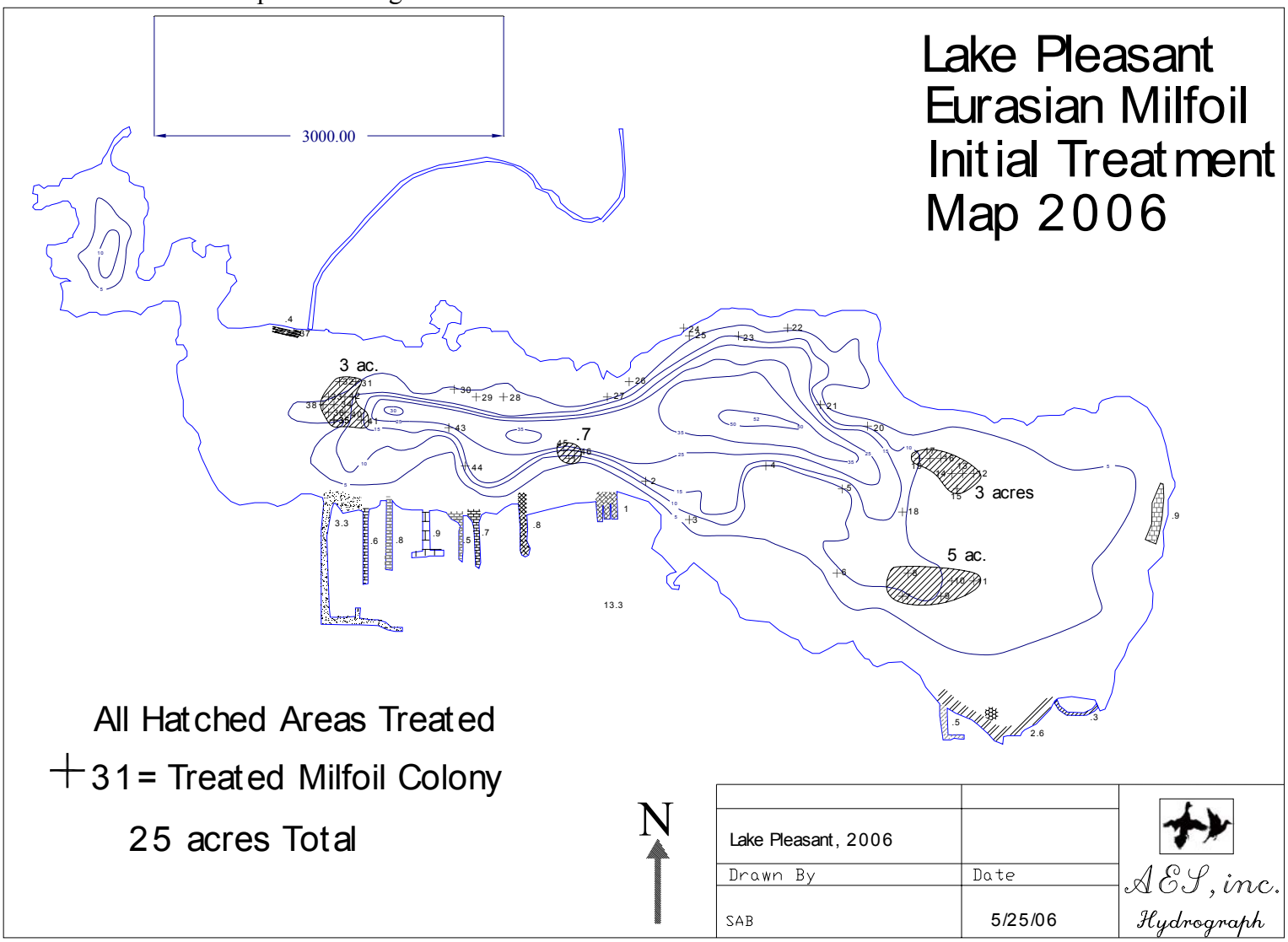


Fig. 1 Areas of significant Eurasian watermilfoil colonization and treatment in 2006

Treatment in 2006 was carried out on June 1st. Lake Pleasant's water temperature at that time was 77.4 degrees (F). The air temperature was 75 degrees (F) with a light west wind. A seeder spreader mounted on the back of a 16 foot skiff was used to apply the 2, 4-D product. It is likely that the Eurasian watermilfoil plants dropped out of the water column within three weeks. Post treatment Tier I and Tier II surveys performed in August and spot checks performed in September (under better fall water clarity) showed very little Eurasian watermilfoil re-growth in Lake Pleasant. Under the Tier I

survey protocol conducted in May, 25 distinct plantbeds were designated in Lake Pleasant. Eurasian watermilfoil was observed in 18 of the 25. It was assigned a visual abundance rating of greater than 2 (scale of one to four) in eight of those plantbeds (figure 2).

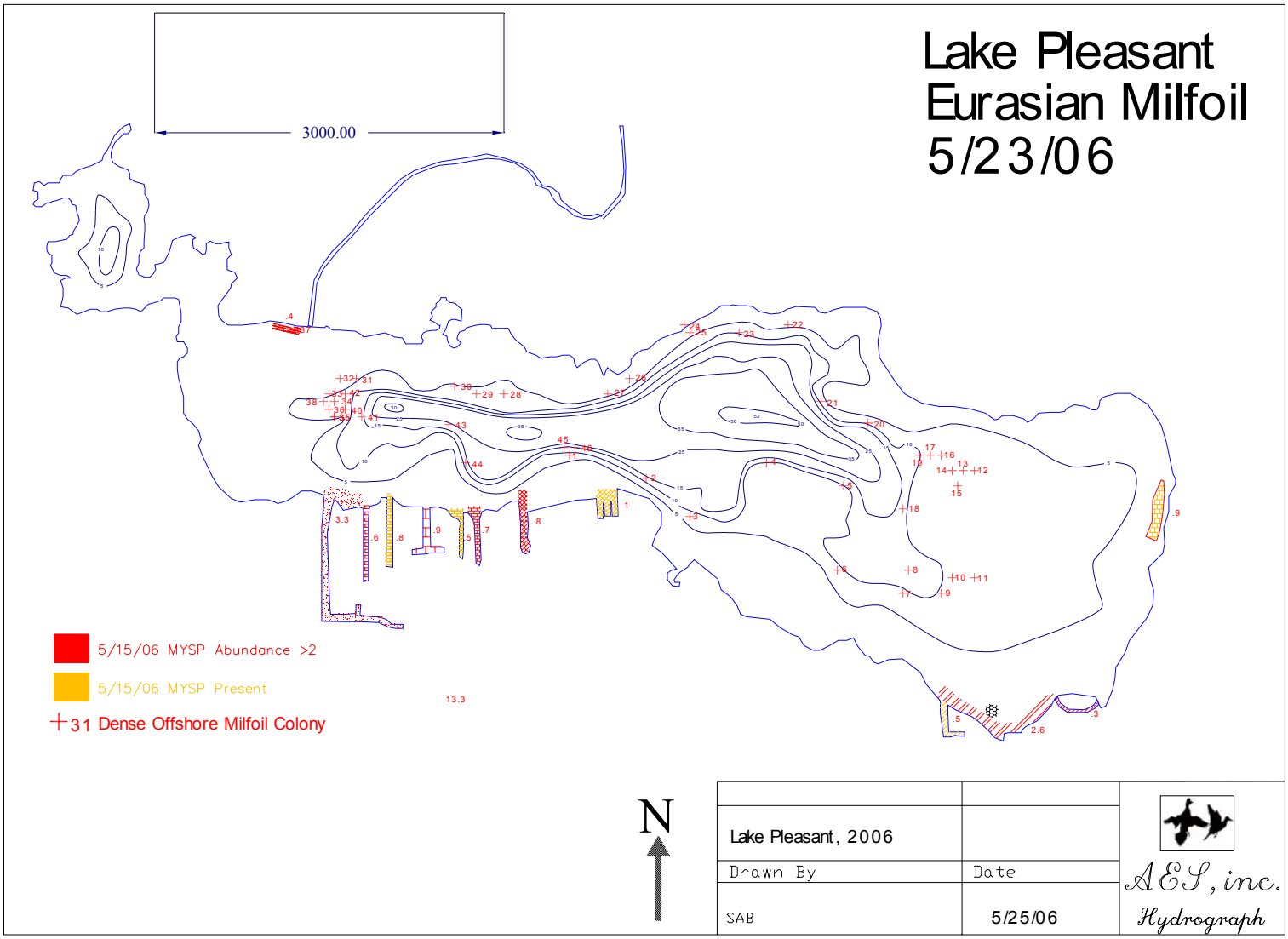


Fig. 2 Eurasian watermilfoil map for Lake Pleasant 5/15/06

During the post-treatment Tier I survey performed in August of 2006 28 separate plantbeds were designated. Eurasian watermilfoil was noted in only four and was assigned a visual abundance rating of over 2 in only one plantbed of .3 acres in size (figure 3). During Tier II plant sampling on August 18, 80 random stratified plant-rake tosses in Lake Pleasant failed to produce even a single Eurasian milfoil plant. Curlyleaf pondweed, also an exotic invasive aquatic plant was present in several plantbeds in Lake Pleasant, but did not appear to pose a significant threat to the ecology or recreational viability of Lake Pleasant in 2006. Spiny naiad native species became more prominent in 2006 than in past seasons and may be a plant to watch in the coming season.

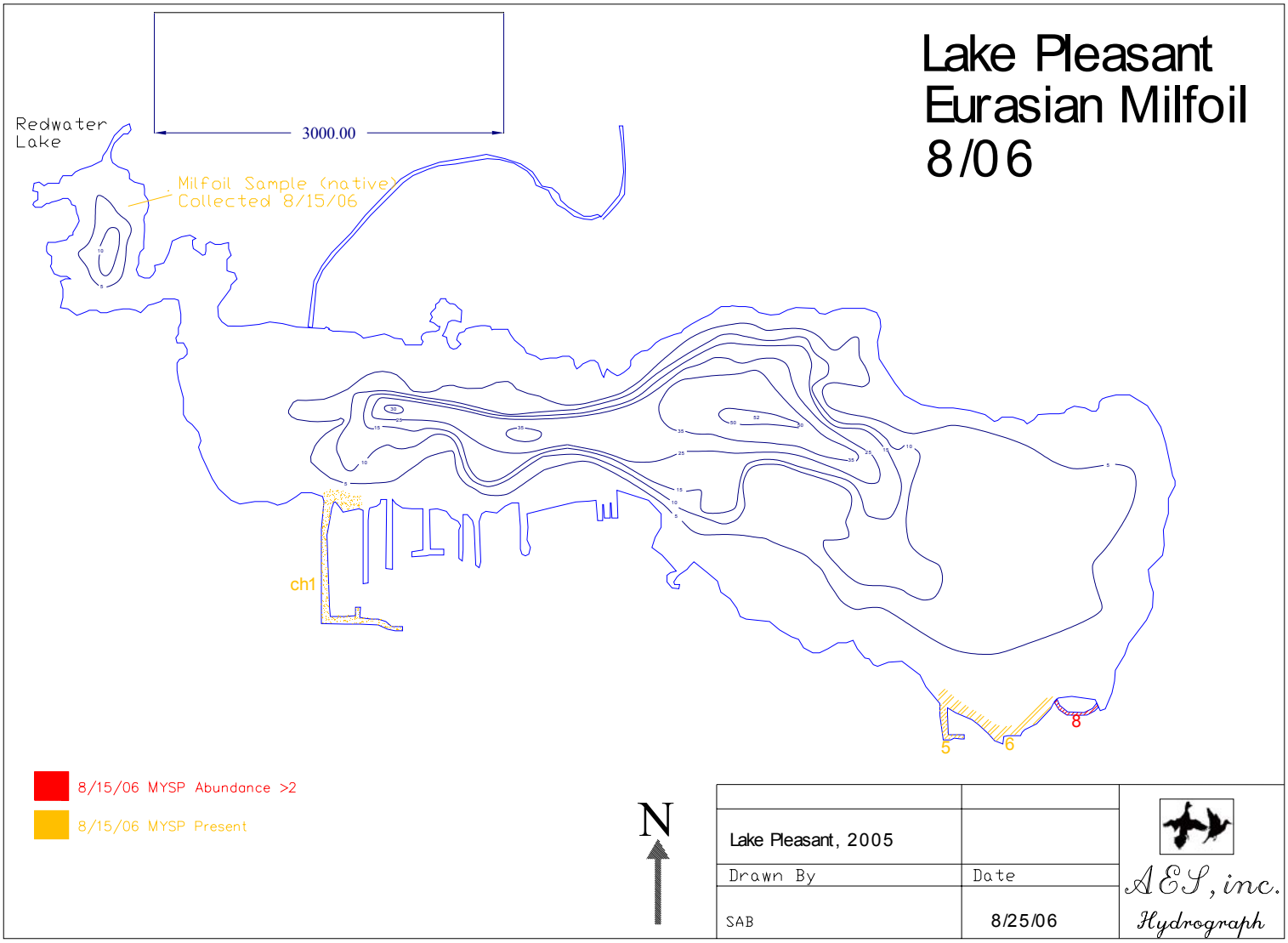


Fig. 3 Eurasian watermilfoil map for Lake Pleasant 8/15/06

8.0 Aquatic Plant Community Characterization

8.1 Methods

Plant sampling in 2006 included Tier I surveys on 5/15/06 and 8/15/07 utilizing the same sampling protocol as in the original Plant Management Plan. For details see: *Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana 2006-2010* (Aquatic Enhancement 2006) A single Tier II survey was performed on 8/15/06. The tier II protocol was modified over the original protocol used in the Plant Management Plan by redesignating rake-toss sampling effort according to lake trophic status (oligotrophic) combined with lake size (417 acres) rather than lake size alone. In addition sampling was performed in a depth-stratified manner with a specified number of samples collected in depth contour categories according to the following table:

		Hypereutrophic		Eutrophic			Mesotrophic				Oligotrophic				
Lake Acres	Total # of Sites	0-5 foot contour	5-10 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	15-20 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	15-20 foot contour	20-25 foot contour
<10	20	10	10	10	7	3	10	5	3	2	10	4	3	2	1
10-49	30	20	10	10	10	10	10	10	7	3	10	10	5	3	2
50-99	40	30	10	17	13	10	10	10	10	10	10	10	10	7	3
100-199	50	40	10	23	17	10	14	14	12	10	10	10	10	10	10
200-299	60	50	10	30	20	10	18	16	16	10	14	12	12	12	10
300-399	70	60	10	37	23	10	22	20	18	10	17	15	14	14	10
400-499	80	70	10	43	27	10	25	23	22	10	19	18	17	16	10
500-799	90	80	10	50	30	10	29	27	24	10	22	21	19	18	10
>=800	100	90	10	57	33	10	33	31	26	10	25	23	22	20	10

Table 3 Tier II Sample size requirements as determined by lake size, trophic state, and apportioned by depth class (source IDNR)

8.2 Results

8.2.1 Tier I

During the May 15th Tier I survey 25 areas of Lake Pleasant's littoral zone were designated as Plantbeds based on their homogeneity of biological and physical characteristics (see figure 4 below). Collected data for each plantbed is assembled in tables 11 and 12 below. A short description of each plantbed follows.

Plantbed 1- Plantbed one is a .82 acre area including an excavated channel at Manapogo Park Campground and the attached dredged lakeshore area outside the channel. This area is located on the lake's south side. The lake's primary access point is located at the south end of this channel. A paved ramp here allows campers, lake residents, and area boaters and fisherman to access the lake for a fee. This channel experiences more problems with the growth of Eurasian watermilfoil than any other on Lake Pleasant and is likely the point of initial introduction and colonization of this plant. The combination of the boat launch and the milfoil problem also make this channel likely to be one of the primary providers of Eurasian milfoil fragments to other areas of the lake. This makes control in this area important. The substrate of this bed is sand with silt. Six species of submersed aquatic plant were noted in plantbed 1 during the early season survey. This plantbed was dominated by Eurasian watermilfoil and Curlyleaf pondweed in May. An understory of Chara is also present. Little Eurasian milfoil grows past the channel's mouth. Richardson's pondweed is present near and just outside the channels mouth every season. During the post treatment Tier I survey in August this plantbed was redesignated to only include the channel portion (the rest was designated 2a). At that time no Eurasian watermilfoil was found in plantbed A due to the 2006 season treatment. Four species of native plants were noted with Sago pondweed, Coontail, and Slender naiad sharing dominance.

Plantbed 2A- This plantbed is the dredged area immediately outside plantbed one and was only designated as a separate plantbed during the late season survey. This plantbed is .35 acres in size and has a substrate of sand with silt. Five species of native submersed aquatic plants were noted in 2A during the late-season tier I survey with

Illinois pondweed and Richardson's pondweed sharing dominance. Spiny naiad was also present.

Plantbed 1A- This plantbed was designated as a separate plantbed only in the late season survey. During the early season survey it was part of plantbed ch6. Plantbed 1A is a .30 acre dredged shoreline area with lakeside homes and docking areas. It's fertile substrate is silt with sand. Four species of native submersed aquatic plants were noted in 1A during the late-season survey with Illinois pondweed being dominant. No Eurasian watermilfoil was noted in this area.

Plantbed 2- Plantbed two has an area of three acres and incorporates the swimming, docking, and marina areas at Monopogo Park. Much of this area has been dredged for navigation. The bottom is sand with silt and shows intermediate fertility. Four species of submersed aquatic plants were observed during the May survey. Some Eurasian watermilfoil grows in this area, but Chara is dominant and native pondweeds are also present. During the late-season survey Eurasian milfoil had become absent and six species of beneficial native plants were noted. Dominance was shared by Chara, Variable pondweed, and Illinois pondweed.

Plantbed 3- Plantbed three represents the area in the west three quarters of Lake Pleasant between the eight and ten foot contour. It is approximately 47 acres in size. Six species of submersed aquatic plant were noted in this plantbed in the May survey. The substrate is silt with sand and appears to be moderately to highly fertile. Many of Lake Pleasant's small milfoil colonies have appeared in this area. Along contour breaks tall stands of aquatic plants are present in this plantbed, but overall this plantbed is dominated by Chara. The wide flat area at the western end of this plantbed contains mostly low meadow Chara but is spotted with growths of taller plants. During the late-season survey four species of native submersed plant were noted. Eurasian milfoil was not seen. Chara was abundant and dominant.

Plantbed 4- Plantbed four is approximately 17 acres in size and represents the bottom area beyond plantbed three between the 13 and 18 foot contour. The substrate is silt with sand. Only Chara was noted growing in this plantbed in the May survey, but it was very abundant (over 60%). During the late season survey Chara was again noted but at a lesser abundance in the cloudier waters of the late season. Slender naiad was also noted.

Plantbed 5- Plantbed five is approximately one half acres in size. It is an "L" shaped excavated channel located in the southeast portion of the lake. It contains lakeside homes near its end. Its substrate is silt with sand and is very fertile containing much organic matter, especially at the channels terminal end where it catches leaf-fall. Five species of submersed aquatic plants and filamentous algae were noted growing in this plantbed during the May survey. This channels plant community is dominated by Whorled watermilfoil *Myriophyllum verticillatum*. Seven species of native plants were noted in the late season survey with Chara being dominant. Eurasian watermilfoil was noted at a low abundance due to the treatment. Whorled water milfoil was absent as a non-target effect of the treatment.

Plantbed 6- Plantbed six is 2.56 acres in size and represents an area of dredged shoreline in the Southeast corner of the lake and a short connected excavated cove. Much of its shoreline is developed with homes and cottages. Its substrate is silt with sand and rich in organic matter. Seven species of submersed aquatic plants were noted in this area during the May survey. This plantbed was dominated by Eurasian watermilfoil in the pre-treatment period. Use of this area is significantly impaired by this Eurasian milfoil growth. During the late season survey it was present in this area at a very low density. Six beneficial native submersed aquatic plant species were present with Chara being dominant.

Plantbed 7- Plantbed seven is a .25 acre Spadderdock (Yellow water-lily) patch. During the 2006 early season Tier I survey no submersed plants were present in this plantbed. Only a sparse growth of Chara was present during the late-season Tier I survey.

Plantbed 8- Is a small excavated loop channel in the extreme southeast corner of Lake Pleasant. It is .27 acres in size. Its substrate is very fertile silt with sand. A high amount of organic material is present. Four species of submersed plants were present during the May Tier I survey with Eurasian watermilfoil being dominant. A significant amount of Whorled watermilfoil was also present. During the late season survey ten species of submersed plant were noted. Both Eurasian and native milfoil enjoyed significant regrowth here in the 2006 season. This channel was the only treated area to display a significant milfoil regrowth. Despite this, Slender naiad was the dominant plant during the late-season survey.

Plantbed 8.5- This plantbed is a broad 7.2 acre area of luxuriant plant growth. Growth seems to occur rapidly in this area with visual abundance of various species changing rapidly in response to treatment or the progression of the growing season. The substrate of this plantbed is silt with sand. Marl is present. Four plant species were noted during the May Tier I survey including Whitestem and Richardson's pondweeds. Eurasian watermilfoil was dominant. In the late-season five species were noted. In past seasons native pondweeds had become dominant in the post-treatment period, but in 2006 Spiny naiad had become dominant with an abundance rating of 4 (greater than 60%).

Plantbed 9- Plantbed nine encompasses the area of the east three-quarters of Lake Pleasant between the 4.5 and eight foot depth contour (excluding plantbed 8.5). Most of the substrate in plantbed nine is relatively infertile silt with sand on a broad flat. Plant growth is relatively sparse above the six foot contour and on broad-flat areas, with some more substantial plant growth supported along drop-offs . Two native plant species were noted in plantbed nine in the early season survey with five noted during the August survey. No non-native species were seen. Chara was dominant in the early season with Illinois pondweed being most dominant in August.

Plantbed 10- Plantbed 10 is a slight depression with increased fertility over the surrounding sparse flat. It is .85 acres in size with a sand-with-silt substrate. It was designated as a separate plantbed during the May survey but was not considered worthy of designation as a separate plantbed during the late season survey due to similarity to the surrounding plantbed (11). Six species of submersed plants were present during the May survey including Eurasian watermilfoil. This plantbed was part of the 2006 treatment. No milfoil was seen during post-treatment spot checks in August and September.

Plantbed 11- Plantbed 11 is 98.39 acres in size and encompasses nearly all of Lake Pleasant's shallows shoreward of the 4.5 foot depth contour on the lake's main basin. The sand-with-silt substrate is relatively infertile in most areas and plant growth is relatively sparse. Marl is present in most areas. Only Chara and Illinois pondweed were noted in plantbed 11 during both the May and August surveys.

Plantbed 12- This plantbed is a marshy 8.94 acre basin off of the northwest corner of Lake Pleasant. Much of this area is overshadowed by a canopy of White water lilies. A central basin and channel is kept open, presumably by the passage of boats moving through this area into Redwater Lake. The substrate is silt-with-sand, very dark and high in organic material. Despite this the growth of submersed plants is relatively sparse in this area. Only Illinois pondweed was noted in the May survey. During August five species of native submersed plant were present. This was the only location in Lake Pleasant where Floatingleaf pondweed *Potamogeton natans* was seen.

Plantbed 13- This plantbed is Redwater Lake, a distinct 13 acre basin located off of the northwest corner of the lake. The substrate in this basin is rich dark silt-with-sand. The basin is ringed by emergent plantbeds and its waters are dark and acid stained. During the May Tier I survey three species of submersed native plants and Curlyleaf pondweed were noted in Redwater Lake. During the August survey six native species were seen. This is the only location outside the Lake Pleasant channels where native milfoil was seen. No Eurasian watermilfoil was found in Redwater Lake although it is probably highly prone to colonization.

Plantbed 14- Plantbed 14 is a small (.3 acre) area of dredged shoreline near Lake Pleasant's outlet in the northwest corner. As a settling area for organic materials its substrate is composed of rich silt-with-sand. During the May Tier I survey six species of submersed aquatic plant were noted in this area including Eurasian watermilfoil. During the August survey three native species were seen with Chara being dominant. Eurasian watermilfoil was absent.

Plantbed 15- Plantbed 15 was designated only in the late-season Tier I survey. In the May survey it was part of plantbed nine. It represents 3.14 acres between the 4.5 and eight foot contour in the northwest portion of the lake. The substrate in this area is silt with sand. Three species of native plant were noted in this area during August with Chara being dominant.

Plantbed 16- Plantbed 16 also was designated as a separate plantbed in the early season only. It was part of plantbed nine in the early-season Tier I. Its represents 3.34 acres between the 4.5 and eight foot contour on the southwest part of the central Lake Pleasant basin. Its substrate is sand with silt. Three species of submersed aquatic plants were present in August with Chara being dominant.

Plantbed 17- Plantbed 17 represents a 5.9 acre fertile silt-with-sand bottomed area that supports luxuriant plant growth. Five species of submersed aquatic plant were noted during the May Tier I survey including Eurasian watermilfoil. This has been one of the larger areas of dense milfoil colonization in the open lake. Six species of submersed aquatic plant were noted in plantbed 17 in August. Eurasian watermilfoil was not found. Illinois pondweed and Chara shared dominance.

Plantbed 18- Plantbed 18 is located between the eight and 13 foot contour at the lake's west end. It is 6.93 acres in size. The substrate is primarily silt-with-sand. Marl is present. Four species of submersed rooted aquatic plant were present during the May Tier I survey including Eurasian watermilfoil. Chara was dominant. During the August survey four species were noted. Eurasian watermilfoil was not seen.

Plantbed 19- This plantbed lies just inside plantbed 18 between the 13 and 18 foot contour. It is 3.97 acres in size and its substrate is silt-with-sand. Four species were noted during the May Tier I survey including Eurasian watermilfoil. Only Chara was noted in August.

Plantbed 20- Plantbed 20 is 15.82 acres in size and represents the whole of Lake Pleasant's bottom area between the 18 and 26 foot depth contours. The substrate is fertile silt-with-sand with marl present. Plant growth is limited at this depth by the availability of light. During the May Tier I survey only Chara was present. During the August survey Spiny naiad and Vallisneria were also found in Plantbed 20.

Plantbed ch1- Plantbed ch-one includes Lake Pleasant's largest excavated channel and an adjacent emergent wetland and is 8.5 acres in size. Its substrate is fertile silt with sand. A high amount of organic material is present and the waters in this area are slightly acid-stained. Nine species of submersed aquatic plants and filamentous algae were noted in May. Eurasian watermilfoil and an excessive growth of native plants causes impairment in this channel area at times. Eurasian milfoil growth was dense in the upper tier of this channel. Curlyleaf pondweed growth was also relatively dense in portions of this channel. In August the number of species of submersed aquatic plants noted had increased to 11. Eurasian watermilfoil was noted but was not abundant. Native milfoil had disappeared in response to treatment.

Plantbed ch2- This plantbed is a .63 acre channel. Its substrate is silt-with-sand. This channel contains a private boat ramp maintained by a Boat Dealer/Marine store. Nine species of submersed aquatic plants were noted in this channel in May. Eurasian watermilfoil was dominant. During the August survey only three species were seen. Eurasian watermilfoil was not present.

Plantbed ch3- Plantbed ch3 is a .77 acre excavated channel with a sand-with-silt substrate. Nine species of submersed aquatic plant were noted in the May Tier I survey including Eurasian and Native milfoil. Only Chara and Illinois pondweed were noted in the August survey.

Plantbed ch4- Plantbed ch4 is a "T" shaped .88 acre excavated channel. Its bottom is sand with silt. Six species of submersed aquatic plant and filamentous algae were noted in this channel during the May Tier I survey, including Eurasian watermilfoil. Three submersed species were present in August. No Eurasian milfoil was seen.

Plantbed ch5- Plantbed ch5 is a .46 acre excavated channel. Its substrate is sand-with-silt. Six species of submersed aquatic plant and filamentous algae were noted in this channel during the May Tier I survey, including Eurasian watermilfoil. Only Chara, Bladderwort, and Duckweed were present in August.

Plantbed ch6- Plantbed ch6 is a .65 acre excavated channel. Its substrate is sand with silt. In the May survey this plantbed also encompassed the August plantbed 1A. During the May Tier I survey four species of submersed aquatic plant were noted in this channel including Eurasian watermilfoil. During the August survey seven species were noted. Eurasian watermilfoil was not present.

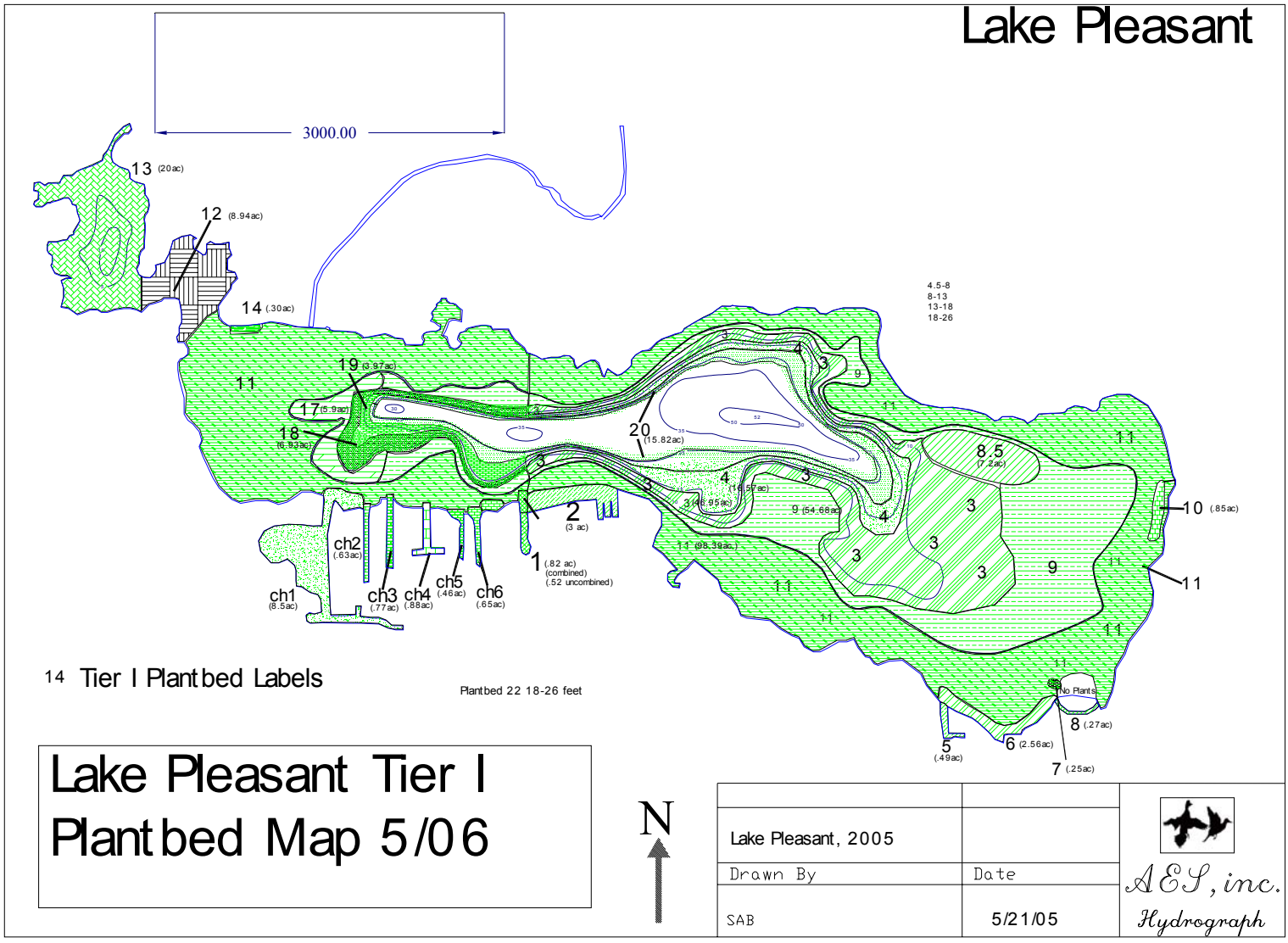


Fig. 4 Early Season Tier I Plantbed map for Lake Pleasant 5/15/06

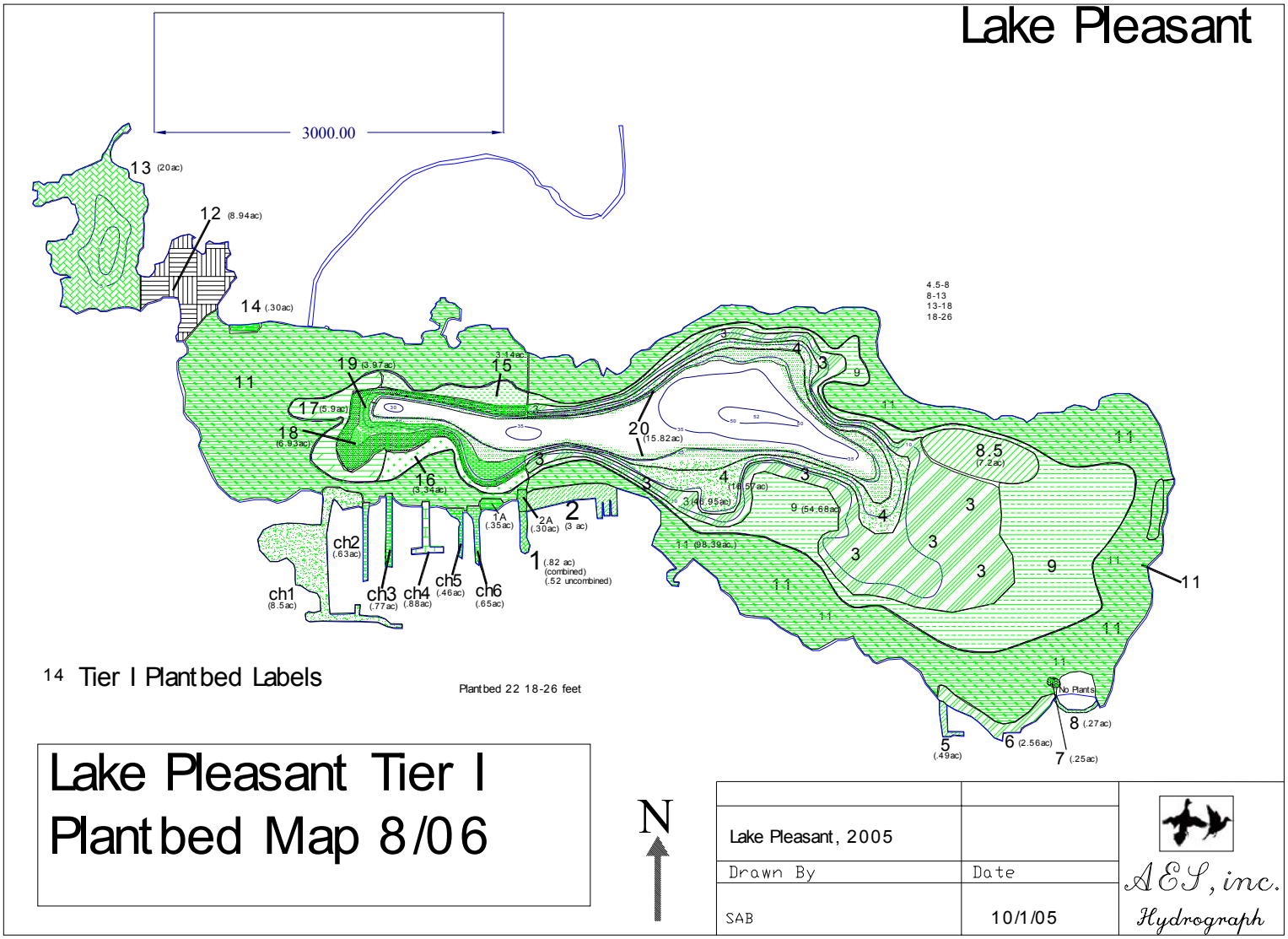


Fig. 5 Late season Tier I plantbed map for Lake Pleasant 8/15/06

Plantbed	1	2	3	4	5	6	7	8	8.5	9	10	11	12	13	14	17	18	19	20	Ch1	Ch2	Ch3	Ch4	Ch5	Ch6
Acres	0.82	3	46.95	16.57	0.49	2.56	0.25	0.27	7.2	54.68	0.85	98.39	8.94	20	0.3	5.9	6.93	3.97	15.82	8.5	0.63	0.77	0.88	0.46	0.65
marl	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
organic	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0
CHAR	2	3	4	4		2		2	2	3	2	1			2	2	3	3	3	2	2	4	2	3	2
MYSP2	3	2	2		2	3		3	3		2				3	2	2	1		3	3	2	3	2	3
MYVE					3			2							2					2	2	2	2	2	
MYSI														1											
POIL		2	2		1	2		2		2	2	1	2	2	3	2	2				1	1		2	
POCR3	3	2	2			2		1						2		2	2	2		3	2	2	1		2
ALGA	1					1								2						3		1	3	3	
PORI	2								2		2									1	1	2			
POPR			2						2																
UTMA			1			2				1				1	2					2					
POPE6					2	2		2			2									2	2	2	3	3	1
POAM					2										2					2					
POZO						2																			
POGR											1					2				2	2	2			
POPU	1																								
ELCA								2																	
ZAPA																					2				

Table 4 May Tier I survey data for Lake Pleasant, 2006

Plantbed	1	1A	2	2A	3	4	5	6	7	8	8.5	9	11	12	13	14	15	16	17	18	19	20	Ch1	Ch2	Ch3	Ch4	Ch5	Ch6
Acres	0.82	0.35	3	0.3	46.95	16.57	0.49	2.56	0.25	0.27	7.2	54.68	98.39	8.94	20	0.3	3.14	3.34	5.9	6.93	3.97	15.82	8.5	0.63	0.77	0.88	0.46	0.65
marl	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
organic	0	0	0	0	0	0	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
CHAR		2	3	3	4	2	3	3	1	2	1		1		3	4	3	3	3	3	2	2	3	2	3	3	4	
MYSP2							1	1		3													1					
MYVE										2					1													
MYSI															1													
POIL		3	3	3	2		2	2		2	3	3	1	3	3	2		2	3	2			3		2			3
POCR3																												
ALGA															1								1					
PORI			2	3	1						3	1																1
POPR																			1									
UTMA								2		2				1	3								2				1	
POPE6	3	2	2	2			2	2		3				1					1				2					2
POAM																							3					
POZO										2													2					
POGR			3				2	2		2				2			2						3					2
POPU																								1				1
ELCA										1																		
ZAPA																												
CEDE	3																											
VAAM2	2	1	2	2	2		1	2			2	2							1			1	1	2		2		1
NAFL	3					1	2			4		2				2	2	2		2			3			4		3
NAMA				2							4								2	2		1						
HEDU str							2					2																
PONA														2														
Lemna sp																											1	

Table 5 August Tier I survey data for Lake Pleasant, 2006

Descriptor	Early Season 6/30/05	Late Season 8/30/05	Late Season 8/15/06	range for 21 other Indiana lakes (Pearson 2004)	mean for 21 other Indiana lakes (Pearson 2004)
# Sampling sites	81	77	**79**		
Total number of species	16	16	**10**	1 to 17	8
Total number of native species	14	13	**9**	1 to 16	7
Mean number of species per site	2.26	2.44	**1.8**	.38 to 2.66	1.61
Species diversity index (SDI), 0-1 scale,	0.82	0.85	**.75**	0.0 to .91	0.66
Aquatic Vegetation % Frequency of Occurrence	97.53	100.00	**86.08**	n/d	n/d

Table 6 Tier II Plant Community Descriptors for Lake Pleasant 2005/2006

8.2.2 Tier II

Tier II plant sampling was conducted on August 15, 2006. Rake tosses were performed at 79 random stratified sampling sites per INDR Tier II Protocol. (IDNR 2006) Sampling site coordinates were recorded on a WAAS enabled hand-held GPS unit, converted to Autocad® coordinates, and mapped on a contour map of Lake Pleasant. (Figure 6) Basic statistical plant community descriptors for the three Tier II surveys performed on Lake Pleasant in 2005 and 2006 are listed in the table above. (Table 13) These descriptors were calculated based on the descriptor set from (Pearson 2004). For comparison, the range and mean of descriptors from a set of 21 other Indiana lakes (Pearson 2004) are listed in the table. Maps showing rake scores and collection locations for the three most abundant species; Slender naiad, Illinois pondweed, and Chara are also provided. (Figures 7, 8, and 9 respectively)

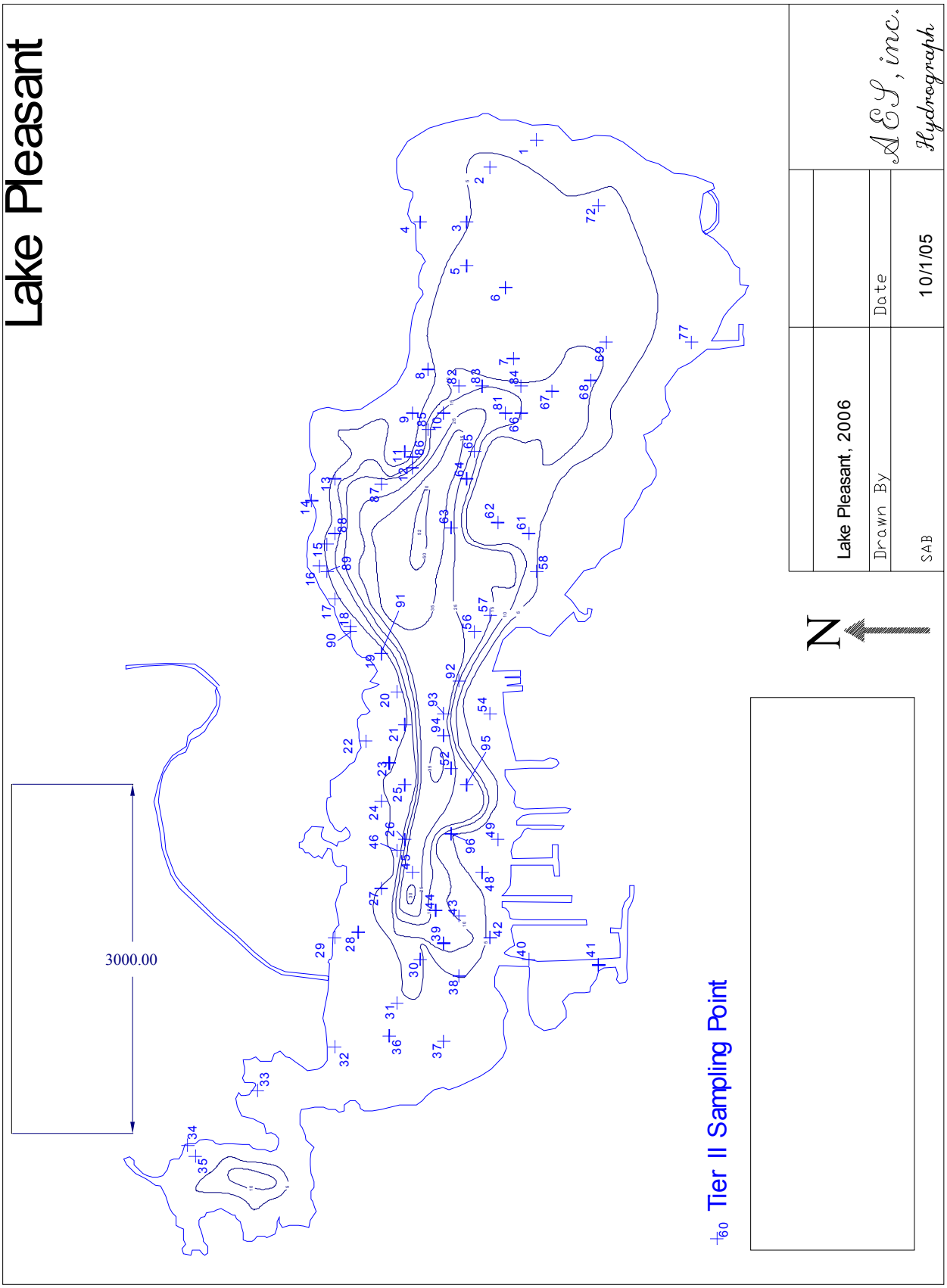


Fig. 6 Tier II sampling sites 8/15/06

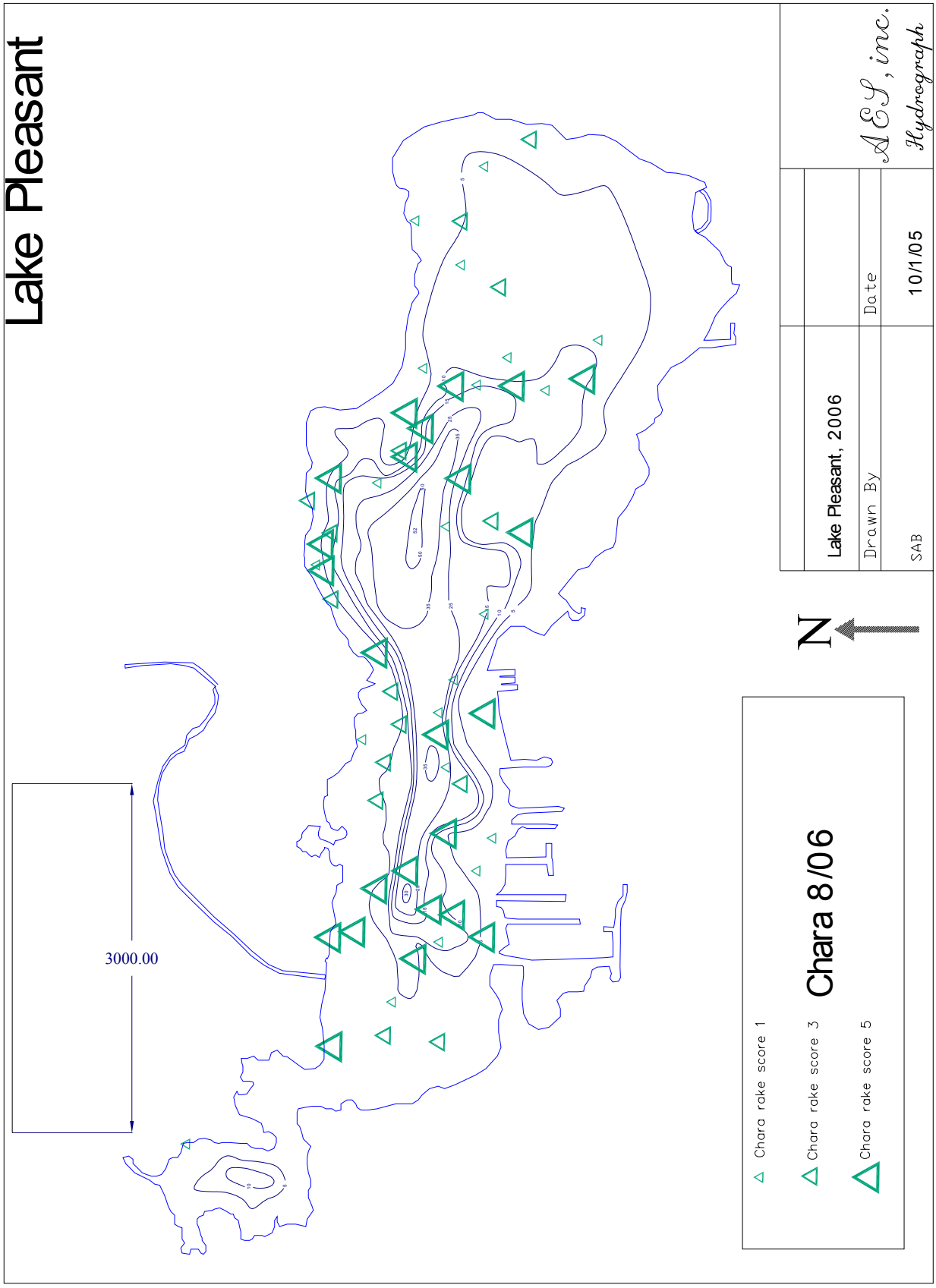


Fig. 7 Chara Map for Lake Pleasant 8/15/06

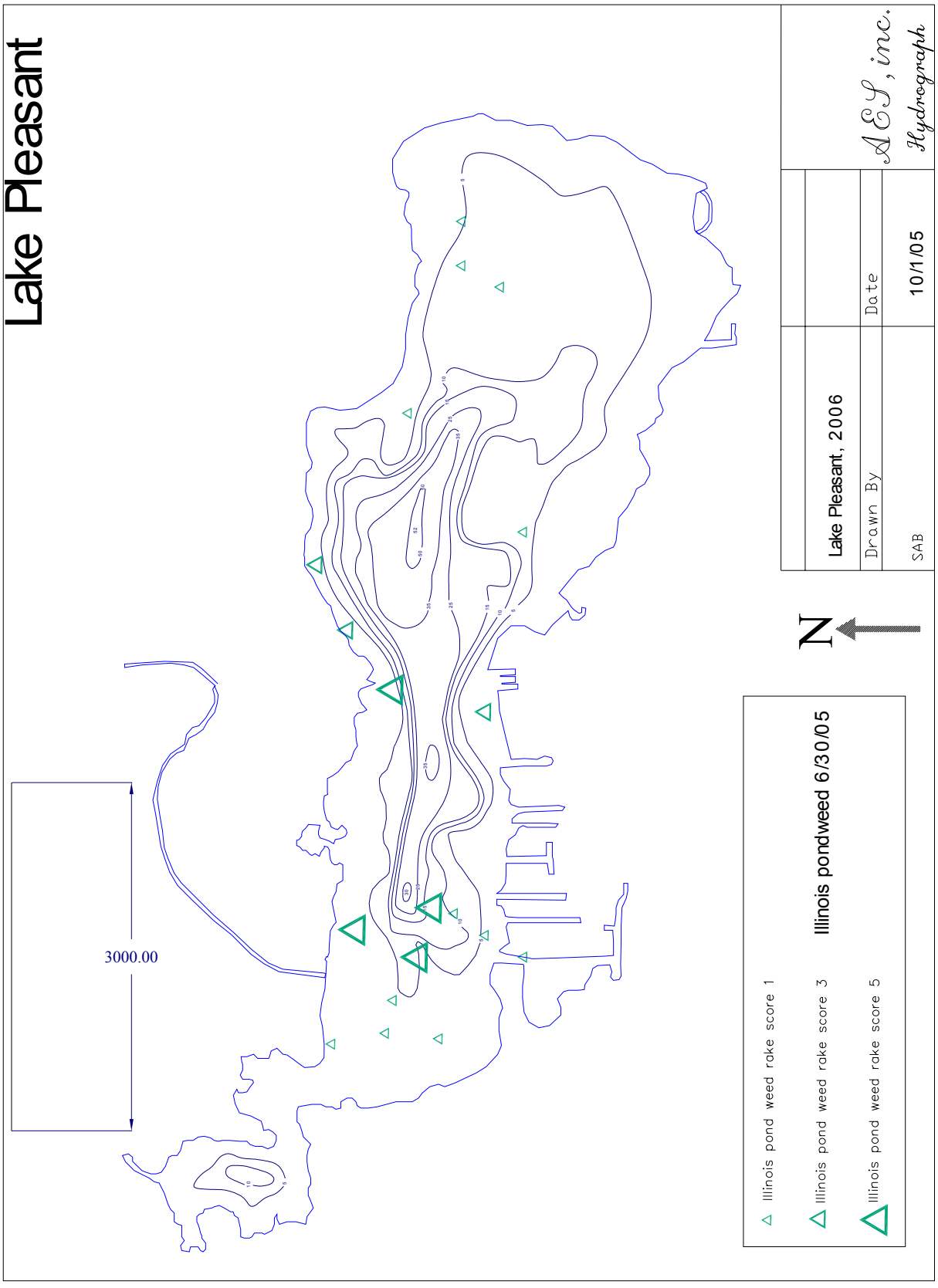


Fig. 8 Illinois pondweed map for Lake Pleasant 8/15/06

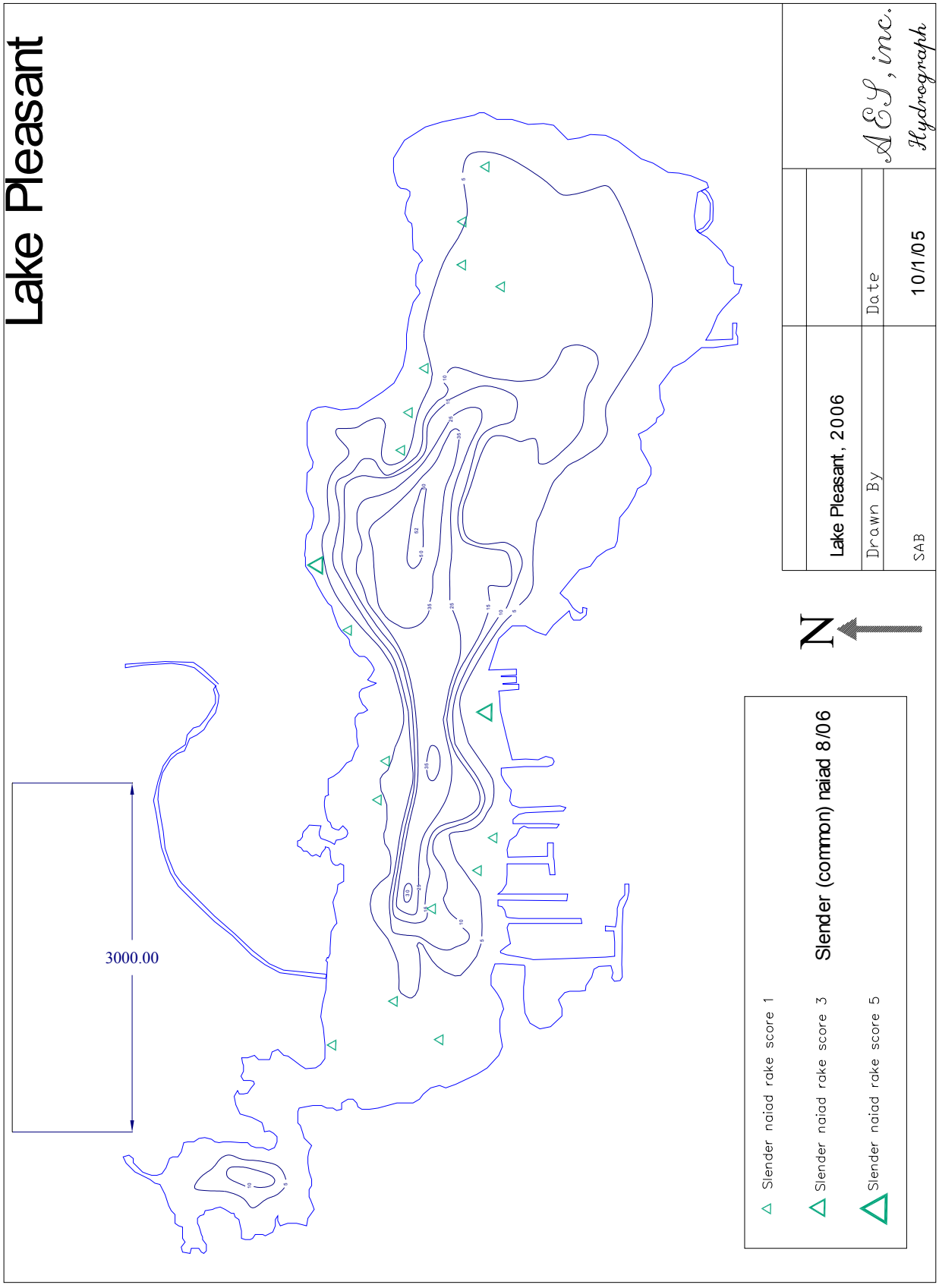


Fig. 9 Slender naiad map for Lake Pleasant, 2006

8.3 Macrophyte Inventory Discussion

As usual Lake Pleasant's plant community displayed more diversity than most the lakes in the 21 Indiana Lake reference set. (see table 13) Ten species were collected compared to a mean of 8 for the set of 21 lakes. Nine native species were collected compared to an average of seven for the set of 21 lakes. The mean number of species-per-site was 1.8 compared to a 21 lake mean of 1.61. The species diversity index score for the 8/15/06 sampling was .75 compared to a 21 lake mean of .66. Vegetation was recovered at 86% of all sampling sites. Scores related to diversity were, however, significantly reduced over the late season scores from 2005. This is probably partly a result of the 2006 season modification of the sampling protocol. In the 2006 sampling, a higher number of samples were collected in deeper water to comply with the new depth-stratified sampling protocol. Ten rake tosses occurred between the 20 and 25 foot depth contour in 2006 compared to only five in 2005. At that depth in Lake Pleasant rake tosses often return only Chara or no plants at all. The August 2006 Tier II data seemed to reinforce observations that the 2,4-D treatments were much more effective in gaining long-term control of Eurasian watermilfoil growth than the Reward® contact herbicide had been in the 2005 treatment. In 2005 Eurasian watermilfoil was collected at 14 sites (18%) while in 2006 none was collected. Chara was the most abundant plant being collected at 77.5% of sampling sites. Illinois pondweed *Potamogeton Illinoensis* a beneficial species of native pondweed, seemed to be slightly less prominent in 2006 being present at only approximately 24% of sampling sites compared to about 43% in 2005. It was the second most abundant plant in the Tier II sampling. The decrease from 2005 may have been partly a result of the modified sampling regime, but slightly decreased water clarity may have played a role. Vallisneria *Vallisneria americana* a species favored as a food source by waterfowl, was also less prominent in the sampling occurring at 7.5% of sites in 2006 compared to 12% in 2005. Richardson's pondweed *Potamogeton richardsonii,* a state listed "rare" species was seen but not collected in the sampling. It was collected at six sampling sites in 2005. Whitestem pondweed *Potamogeton praelongus* a state listed "threatened" species was recovered at 2.5% of sites compared to none being recovered in the late season sampling in 2005. Whorled watermilfoil *Myriophyllum verticillatum* another state listed "rare" species was present but not recovered in the sampling. This was probably a result of less sampling points occurring in its favored habitat in the lake's channels in 2006 than in 2005 and also the 2, 4-D treatment having controlling this non-target plant in treated areas. It was found to be growing in Redwater Lake in 2006 where no treatment for Eurasian milfoil is expected to take place. This area will serve as an untreated refuge for this uncommon plant. In the 2005 late-season Tier II survey this plant was collected at two sampling points. Slender naiad was the third most abundant plant collected in 2006 being recovered at 22.5% of sites. This was similar to 2005 when it was collected at 24% of sites. Chara was noted growing to a depth of 25 feet in 2006 compared to 26.5 feet in 2005. Since sampling under the new protocol occurred to a depth of 25 feet it proved to be a reasonable match for depth of the plant community. Overall the Tier II sampling indicates the presence of a diverse and healthy plant community and good treatment results. The table below displays plant samples collected and sent to botanists at Purdue University North Central for identification and/or voucher preservation. Tables are also

provided which display comparison data for various species for the 2005 and 2006 season surveys and data for various species with the lakes various depth contour zones.

Date Collected	Sample Number	Initial Identification (Suspected)	Substrate	Lat	Lon	Other plants in association	Depth	Pudue University North Central Identification
8/15/06	1(Redwater Lake)	*Myriophyllum sp.(several plants)*	Silt/clay, organic	41 deg 45.70 min N	85 deg 6.52 min W	Potamogeton Illinoensis, Nymphea tuberosa	5 ft	*Myriophyllum verticillatum, Myriophyllum sibiricum*
9/18/06	No number	*Chara sp.*	Sand with silt	CH5		No data	3 ft	*Chara zeylanica* or *Chara haitensis*

Table 7 Voucher specimens collected in 2006

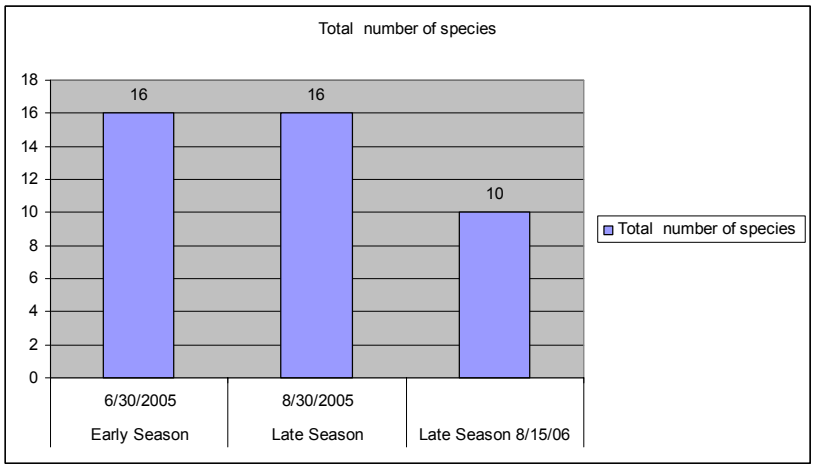


Fig. 10 Total number of species 2005-2006

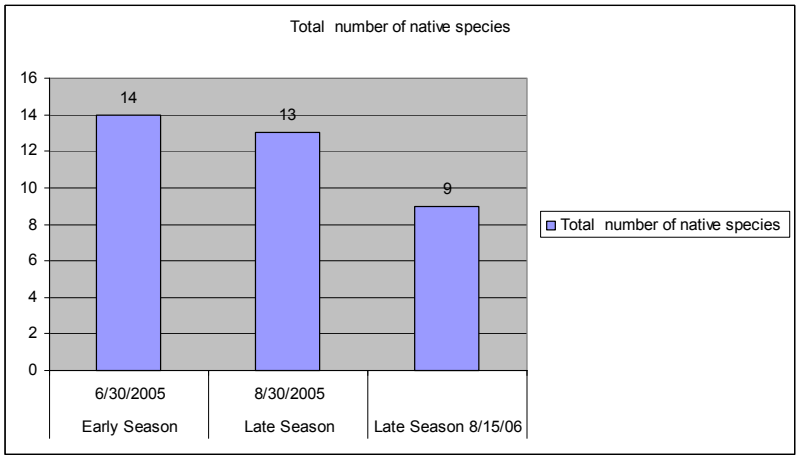


Fig. 11 Total number of native species 2005-2006

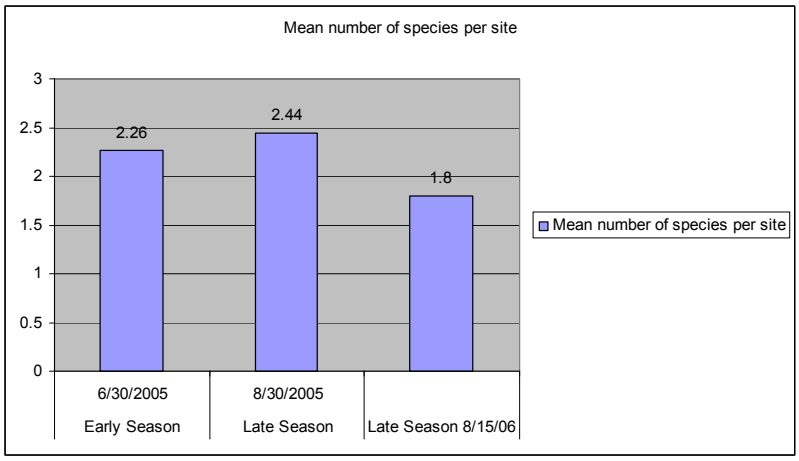


Fig. 12 Mean number of species per site 2005-2006

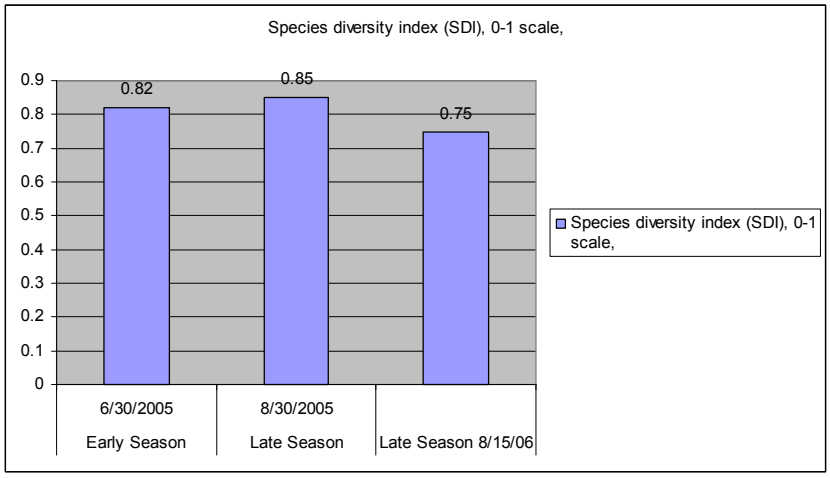


Fig. 13 Species diversity index 2005-2006

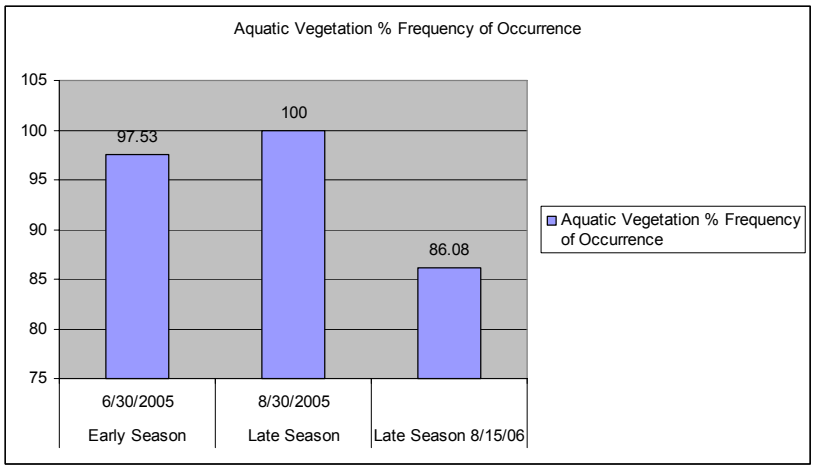


Fig. 14 Aquatic vegetation % frequency of occurrence 2005-2006

Species	occurrence (# of sites)	% of sites	mean density	relative density
Chara	62	77.50%	3	2.35
Eurasian watermilfoil	**0**			
Curlyleaf pondweed	**0**			
Illinois pondweed	19	23.75%	2.2	0.51
Vallisneria	6	7.50%	2.7	0.2
Coontail	2	2.50%	3	0.08
Great bladderwort	6	7.50%	1	0.08
Slender naiad (common naiad)	18	22.50%	1.2	0.28
Spiny naiad	17	21.25%	1.9	0.41
Whitestem pondweed	2	2.50%	2	0.05
Sago pondweed	2	2.50%	1	0.03
Variable pondweed	8	10.00%	1	0.1

Table 8 Species specific Tier II descriptors for Lake Pleasant 8/15/06

Plant Common Name	6/30/2005 % of sites	8/30/2005 % of sites	8/15/06 % of sites
Chara	81%	71%	77.50%
Eurasian watermilfoil	**11%**	**18%**	
Curlyleaf pondweed	**19%**	**4%**	
Illinois pondweed	37%	43%	23.75%
Vallisneria	12%	16%	7.50%
Coontail	4%	6%	2.50%
Whorled watermilfoil	6%	3%	
Great bladderwort	14%	12%	7.50%
Slender naiad (common naiad)	21%	31%	22.50%
Spiny naiad			21.25%
Water stargrass	1%	3%	
Flatstem pondweed	1%	3%	
Richardson's pondweed	2%	8%	
Whitestem pondweed	2%		2.50%
Small pondweed	4%	3%	
Sago pondweed	9%	1%	2.50%
Variable pondweed	12%	13%	10.00%
Secchi Depth (ft)	8.7	11.3	7.0

Table 9 Species % occurrence 2005-2006

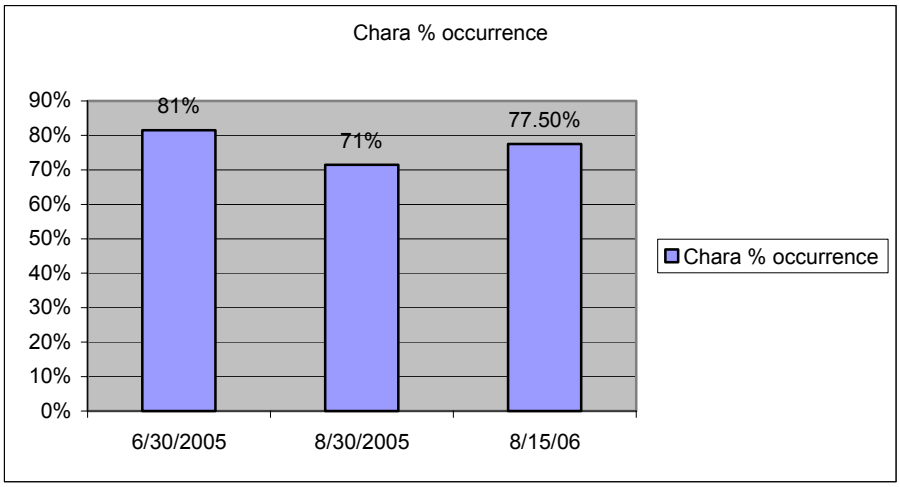


Fig. 15 Chara % occurrence 2005-2006

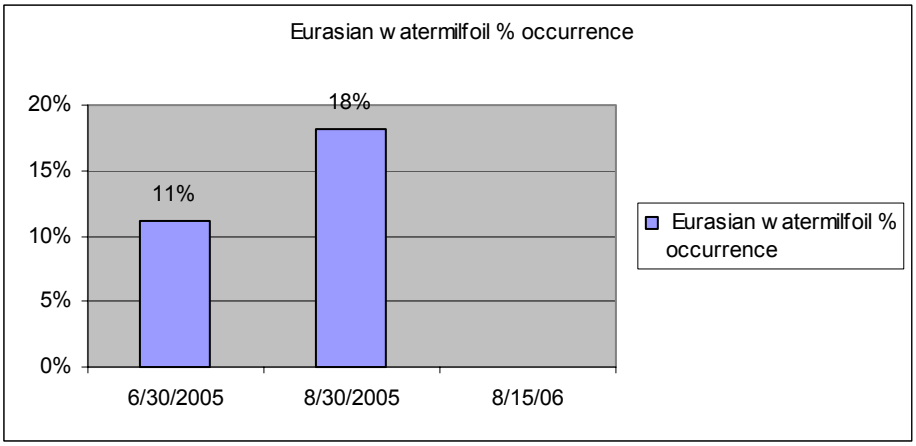


Fig. 16 Eurasian watermilfoil % occurrence 2005-2006

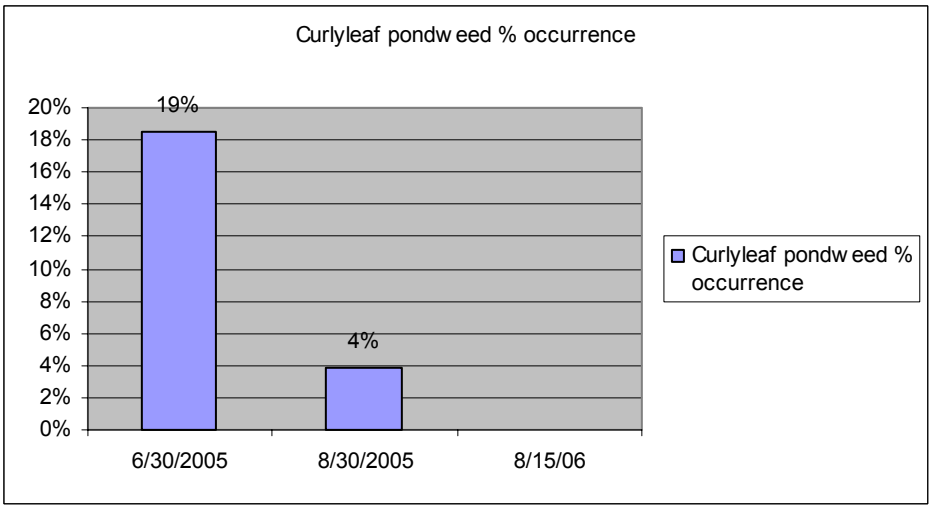


Fig. 17 Curlyleaf pondweed % occurrence 2005-2006

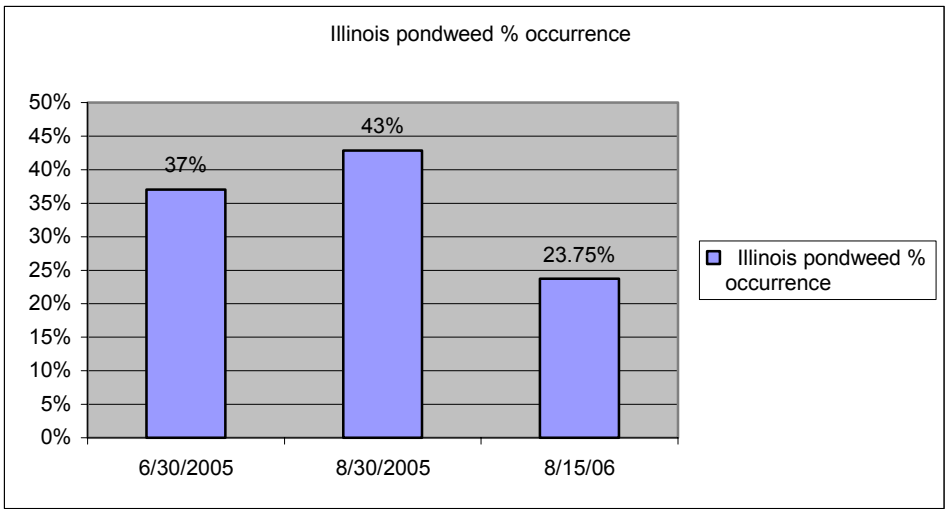


Fig. 18 Illinois pondweed % occurrence 2005-2006

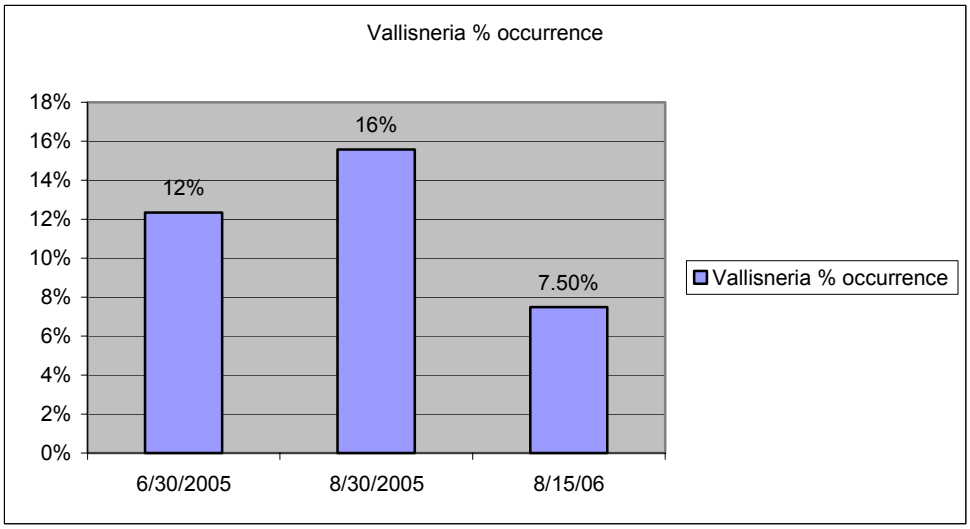


Fig. 19 Vallisneria % occurence 2005-2006

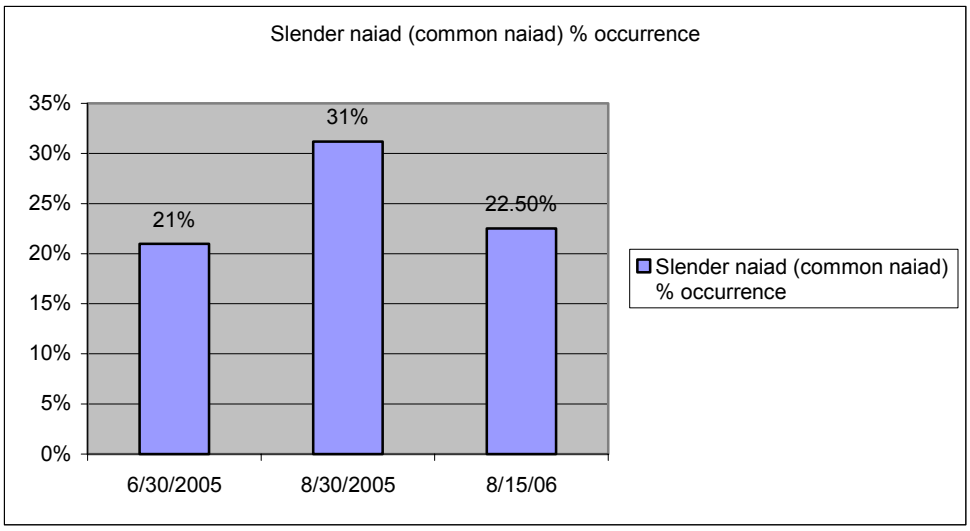


Fig. 20 Slender naiad % occurrence 2005-2006

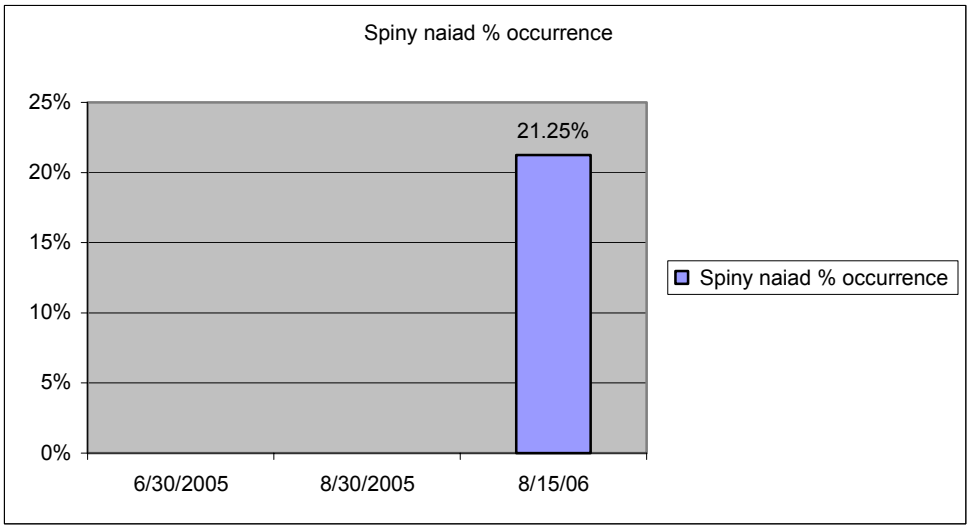


Fig. 21 Spiny naiad % occurrence 2005-2006

Depth Contour (ft) **All**

Common Name(s)	# sites	% occurrence 0-5.9 ft contour	mean density	relative density
Chara	62	78.48	3.03	2.38
Illinois pondweed	19	24.05	2.16	0.52
Common naiad	18	22.78	1.22	0.28
Spiny naiad	17	21.52	1.94	0.42
Variable pondweed	8	10.13	1.00	0.10
Vallisneria, Tapegrass	6	7.59	2.67	0.20
Great bladderwort	6	7.59	1.00	0.08
Sago pondweed	2	2.53	1.00	0.03
Coontail	2	2.53	3.00	0.08
Whitestem pondweed	2	2.53	2.00	0.05

Table 10 Species descriptors, all contours

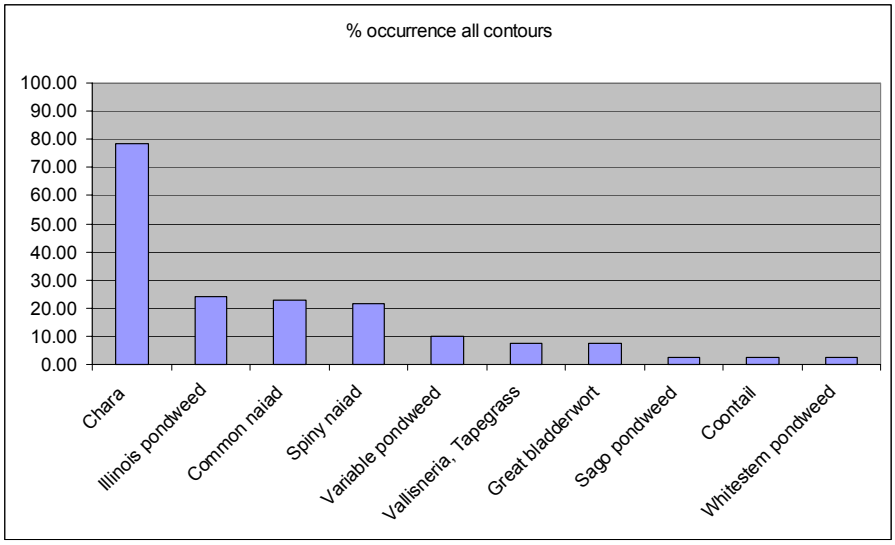


Fig. 22 Species % occurrence, all contours

Lake Pleasant 8/15/06	Contour (ft)
	0-5.9

(submersed species only, fil. algae excluded)

Descriptor	
Sampling sites	17
Total number of species	8
Total number of native species	8
Mean number of species per site	2.29
Species diversity index (SDI), 0-1 scale,	0.76
Aquatic Vegetation % Frequency of Occurrence	94.12

Table 11 Plant community descriptors, 0-5.9 foot contour

Depth Contour (ft) 0-5.9

Common Name(s)	# sites	% occurrence 0-5.9 ft contour	mean density	relative density
Chara	15	88.24	2.60	2.29
Illinois pondweed	7	41.18	1.29	0.53
Common naiad	8	47.06	1.25	0.59
Spiny naiad	1	5.88	1.00	0.06
Variable pondweed	4	23.53	1.00	0.24
Vallisneria, Tapegrass	1	5.88	1.00	0.06
Great bladderwort	2	11.76	1.00	0.12
Sago pondweed	0	0.00	#DIV/0!	0.00
Coontail	1	5.88	1.00	0.06
Whitestem pondweed	0	0.00	#DIV/0!	0.00

Table 12 Species descriptors 0-5.9 foot contours

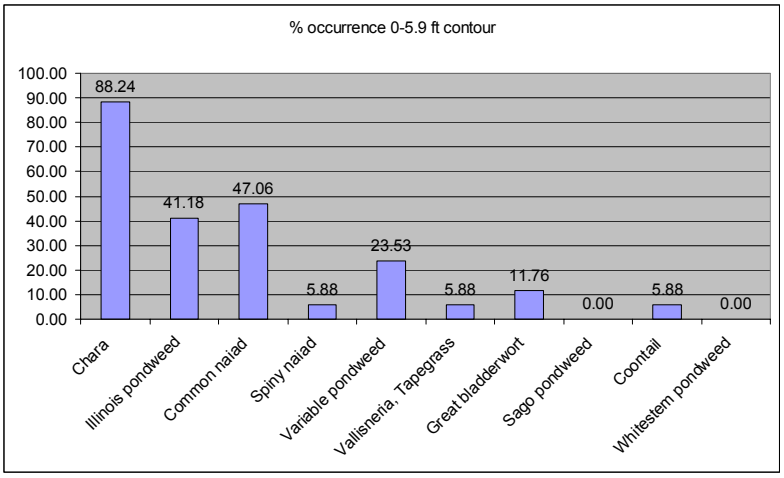


Table 13 Species % occurrence 0-5.9 foot contours

Lake Pleasant 8/15/06	Contour (ft)
	6-10.9

(submersed species only, fil. algae excluded)

Descriptor	
Sampling sites	18
Total number of species	10
Total number of native species	9
Mean number of species per site	2.94
Species diversity index (SDI), 0-1 scale,	0.83
Aquatic Vegetation % Frequency of Occurance	94.44

Table 14 Plant community descriptors 6-10.9 foot contour

Depth Contour (ft) 6-10.9

Common Name(s)	# sites	% occurrence 6-10.9 ft contour	mean density	relative density
Chara	15	83.33	3.00	2.50
Illinois pondweed	10	55.56	2.40	1.33
Common naiad	8	44.44	1.25	0.56
Spiny naiad	8	44.44	1.50	0.67
Variable pondweed	3	16.67	1.00	0.17
Vallisneria, Tapegrass	2	11.11	2.00	0.22
Great bladderwort	3	16.67	1.00	0.17
Sago pondweed	2	11.11	1.00	0.11
Coontail	1	5.56	5.00	0.28
Whitestem pondweed	1	5.56	1.00	0.06

Table 15 Species descriptors 6-10.9 foot contour

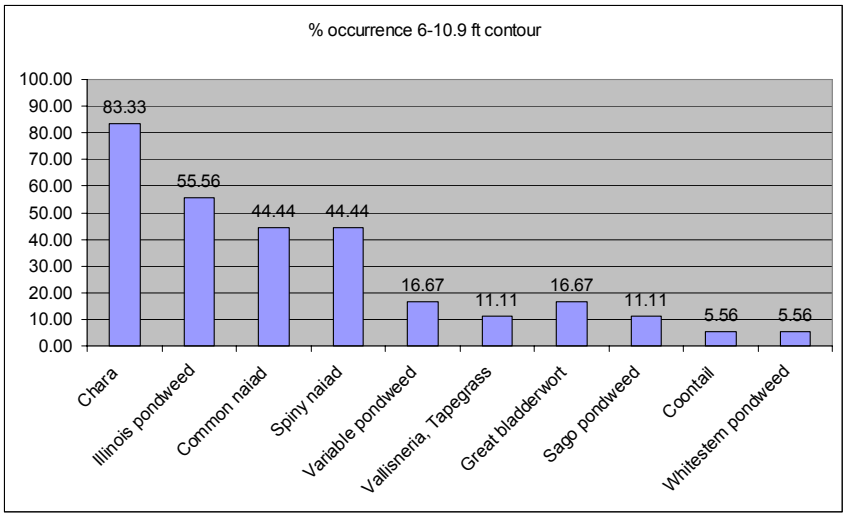


Fig. 23 Species % occurrence 6-10.9 foot contour

Lake Pleasant 8/15/06	Contour (ft)
	11-15.9

(submersed species only, fil. algae excluded)

Descriptor	
Sampling sites	17
Total number of species	6
Total number of native species	6
Mean number of species per site	1.65
Species diversity index (SDI), 0-1 scale,	0.65
Aquatic Vegetation % Frequency of Occurrence	100.00

Table 16 Plant community descriptors 11-15.9 foot contour

Depth Contour (ft) 11-15.9

Common Name(s)	# sites	% occurrence 11-15.9 ft contour	mean density	relative density
Chara	15	88.24	4.20	3.71
Illinois pondweed	2	11.76	4.00	0.47
Common naiad	2	11.76	1.00	0.12
Spiny naiad	6	35.29	3.00	1.06
Variable pondweed	0	0.00		0.00
Vallisneria, Tapegrass	2	11.76	5.00	0.59
Great bladderwort	0	0.00		0.00
Sago pondweed	0	0.00		0.00
Coontail	0	0.00		0.00
Whitestem pondweed	1	5.88	3.00	0.18

Table 17 Species descriptors 11-15.9 foot contour

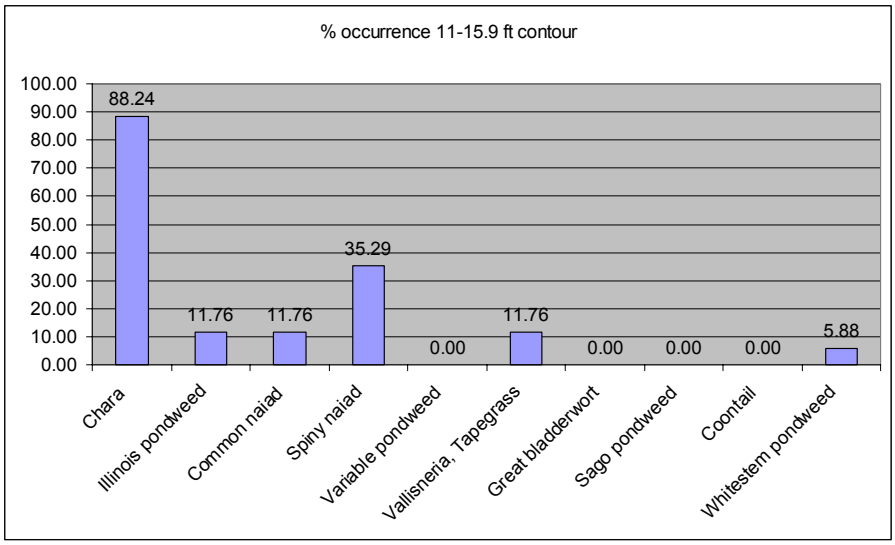


Fig. 24 Species % occurrence 11-15.9 foot countour

Lake Pleasant 8/15/06	Contour (ft)
	16-20.9

(submersed species only, fil. algae excluded)

Descriptor	
Sampling sites	17
Total number of species	5
Total number of native species	5
Mean number of species per site	1.06
Species diversity index (SDI), 0-1 scale,	0.38
Aquatic Vegetation % Frequency of Occurrence	82.35

Table 18 Plant community descriptors, 16-20.9 foot contour

Depth Contour (ft) 16-20.9

Common Name(s)	# sites	% occurrence 16-20.9 ft contour	mean density	relative density
Chara	14	82.35	2.57	2.12
Illinois pondweed	0	0.00		0.00
Common naiad	0	0.00		0.00
Spiny naiad	1	5.88	1.00	0.06
Variable pondweed	1	5.88	1.00	0.06
Vallisneria, Tapegrass	1	5.88	1.00	0.06
Great bladderwort	1	5.88	1.00	0.06
Sago pondweed	0	0.00		0.00
Coontail	0	0.00		0.00
Whitestem pondweed	0	0.00		0.00

Table 19 Species descriptors, 16-20.9 foot contour

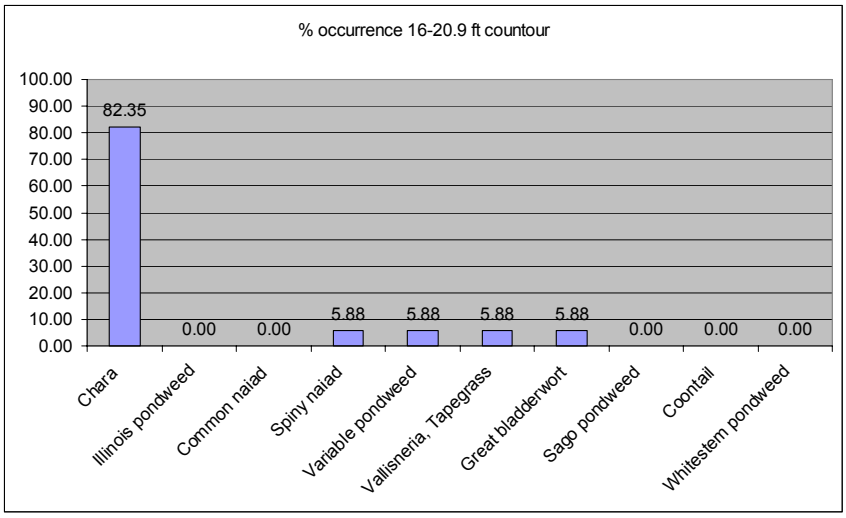


Fig. 25 Species % occurrence 16-20.9 foot contour

Lake Pleasant 8/15/06	Contour (ft)
	21-25

(submersed species only, fil. algae excluded)

Descriptor	
Sampling sites	10
Total number of species	2
Total number of native species	2
Mean number of species per site	0.40
Species diversity index (SDI), 0-1 scale,	0.38
Aquatic Vegetation % Frequency of Occurrence	40.00

Table 20 Plant community descriptors, 21-25 foot contour

Depth Contour (ft) 21-25

Common Name(s)	# sites	% occurance 21-25 ft contour	mean density	relative density
Chara	3	30.00	1.67	0.50
Illinois pondweed	0	0.00		0.00
Common naiad	0	0.00		0.00
Spiny naiad	1	10.00	1.00	0.10
Variable pondweed	0	0.00		0.00
Vallisneria, Tapegrass	0	0.00		0.00
Great bladderwort	0	0.00		0.00
Sago pondweed	0	0.00		0.00
Coontail	0	0.00		0.00
Whitestem pondweed	0	0.00		0.00

Table 21 Species descriptors, 21-25 foot contour

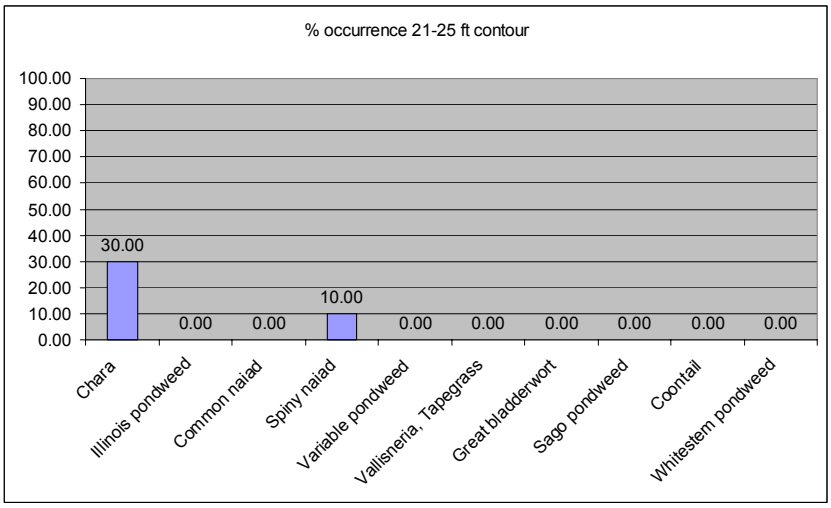


Fig. 26 Species % occurance, 21-25 foot contour

9.0 Aquatic Vegetation Management Alternatives

No new applicable plant management alternatives are available at this time. New alternative selective herbicides may be released to the market and prove efficacious in the near future and will be considered for use on Lake Pleasant at that time.

10.0 Public Involvement

A public meeting was held on 6/10/06 at Lake Pleasant. Approximately 19 people were in attendance. A discussion was held about the status and goals of the Lake Pleasant Aquatic Plant Management Plan and opportunity was provided for lake residents to ask questions and provide input regarding the 2006 season's plant management and assocated water-use restrictions. A Eurasian watermilfoil plant was passed around the room to improve the ability of lake residents to identify and recognize it. A speaker from the Steuben County Lakes Council was also present to discuss the impacts of boating use on area lakes and ongoing efforts to measure and evaluate it. The Lake Use Survey below (fig. 27) was distributed to those present, filled out, and collected. Nineteen surveys were completed. Results are tabulated in table 29 below. Survey respondents were all lake property owners and 18 of 19 were association members. Most had owned property at the lake for more than ten years. When asked to mark lake activities enjoyed often 100% of respondents reported swimming and boating. Sixteen of 19 reported fishing, twelve marked skiing/tubing, seven reported that they irrigated from the lake and one reported waterfowl hunting as an activity. Nine respondents reported that they had aquatic plants along their shoreline in nuisance quantities while eight indicated that they did not. Eleven of the respondents reported owning property on one of the lake's channels while 12 indicated they had lakeshore property. Four reported both (probable owners of corner lots at a channel mouth). Eleven respondents felt that aquatic

vegetation did affect the value of their property, while five felt that it did not. Respondents were unanimously in favor of continued efforts to control vegetation. Seventeen of nineteen reported that they understood that LARE funding would only assist with the control of exotic plants; two did not answer this question. When asked to choose from a list of other possible problems at the lake 17 marked "Canada geese", nine each indicated "too many plants" and "dredging needed" as a problem. It was specified by two respondents that the dredging was needed on a channel. Two respondents indicated that too many boats access the lake and one indicated "too much fishing" as a problem. When invited to write-in further comments one resident indicated that the aquatic weeds on the channel were worse in 2006 than in the previous season. One complained of the erratic operation of personal watercraft on the lake. Overall the Lake Pleasant residents don't appear to feel that they have a profound problem with aquatic plants at their individual properties yet, but do feel their property values can be affected by their invasive aquatic plant problems and are overwhelmingly in favor of continued efforts to control Eurasian watermilfoil. This is probably an indication that the residents understand the potential for a huge problem to develop at Pleasant Lake if Eurasian watermilfoil is not actively controlled. Educational efforts appear to have been enjoying some effectiveness. With swimming and boating being the most popular activities of the respondents, avoiding a blossoming colonization by invasive plants will be important at Lake Pleasant.

Lake Use Survey Lake Pleasant 6/10/06

1. Are you a lake property owner? Yes X No_____

2. Are you currently a member of your lake association? Yes X No___

3. How many years have you been at the lake? (circle one) 2 or less,
2 – 5 years
5-10 years
Over 10 years

4. How do you use the lake (mark all that apply)
X Swimming ___Irrigation (including lawn) _____Waterfowl hunting
X Boating X Fishing ___Skiing/Tubing
Other _____

5. Do you have aquatic plants at your shoreline in nuisance quantities? Yes X No ___

6. Do you own or occupy property on a X channel _____Lakeshore_____Neither

7. Does the level of vegetation in the lake affect your property values? Yes X No ___

8. Are you in favor of continuing efforts to control vegetation on the lake? Yes X
No ___

9. Are you aware that the LARE funds will only apply to work controlling invasive exotic species, and more work may need to be privately funded? Yes ___ No X

10. Mark any of these you think are problems on your lake:
___ Too many boats access the lake
___ Too much fishing
X Canada Geese
X Dredging needed
___ Flooding/Lake Level too high
X Too many aquatic plants
___ Not enough aquatic plants
___ Poor water quality
___ Pier/funneling problem

Please add any comments:

my channel opening is closing up due to sand drifting/moving from lake Heller Shady shore #1 Channel

Fig. 27 Lake Pleasant user survey 6/10/06

Lake Property Owner?	Yes	No				
	19					
Are you an association member?	Yes	No				
	18					
Years at the lake?	2 or less	two to five	five to ten	Over 10		
	2		5	12		
How do you use the lake?	Swim	Irrigation	Waterfowl	Boating	Fishing	Ski/Tube
	19	7	1	19	16	12
						Other
Do you have nusiance plants?	Yes	No				1 diving
	9	8				
Do you own property on	Channel	Lakeshore	Neither			
	11	12				
Does the lake vegetation affect	Yes	No				
your property value?	11	5				
Are you in favor of continued	Yes	No				
vegetation control?	19					
Are you aware that LARE funds will	Yes	No				
only apply to exotics?	17					
Mark other lake problems	Too many boats accessing		Too much fishing	Canada Geese	Dredging needed	Flooding/Lake level
	2		1	17	9	
	Too many plants		Not enough plants		Poor water quality	
	9		0		0	
			Pier/Funneling problem			
Add any comments			0			
Weeds in channel worse in 2006						
Dredging needed in channels						
Dredging needed in channels						
Erratic Personal Watercraft operation						

Table 22 Lake Pleasant 2006 user survey results

11.0 Public Education

Efforts at public education seem to be paying off at Lake Pleasant. Residents and users who have attended meetings seem to understand the potential for recreational and ecological impairment at Lake Pleasant if Eurasian watermilfoil is allowed to increase its colonization of the lake. At the same time they understand efforts at containment and control can continue to increase but do not necessarily guarantee success. The issue of controlling Purple loosestrife and other invasive wetland plants has also been addressed at the meetings and these efforts should continue in 2007. It will be wise to stress the possibility of watercraft spreading invasive plants or introducing new invasive plants to the lake. This will be especially important now that Hydrilla has been found in Indiana. The posting of invasive species information at the private accesses at Lake Pleasant and a basic screening process for inbound watercraft will be steps to consider to help protect the lake.

11.1 Hydrilla and its implications for Lake Pleasant

Keeping lake residents and users aware of the possibility of bringing in new invasive species on watercraft trailers will be especially important now that Hydrilla has been found in Indiana. Hydrilla *Hydrilla verticillata* is an invasive submersed aquatic plant thought to be native to Africa, Australia, and parts of Asia. As a hearty growing plant Hydrilla was used in aquariums and this led to its introduction into Florida waters in 1960. Since then Hydrilla has spread to become the single most problematic plant in the United States. (See USGS map below) In Florida alone millions are spent in controlling the growth of Hydrilla each year. The potential exists for the same type of damage on

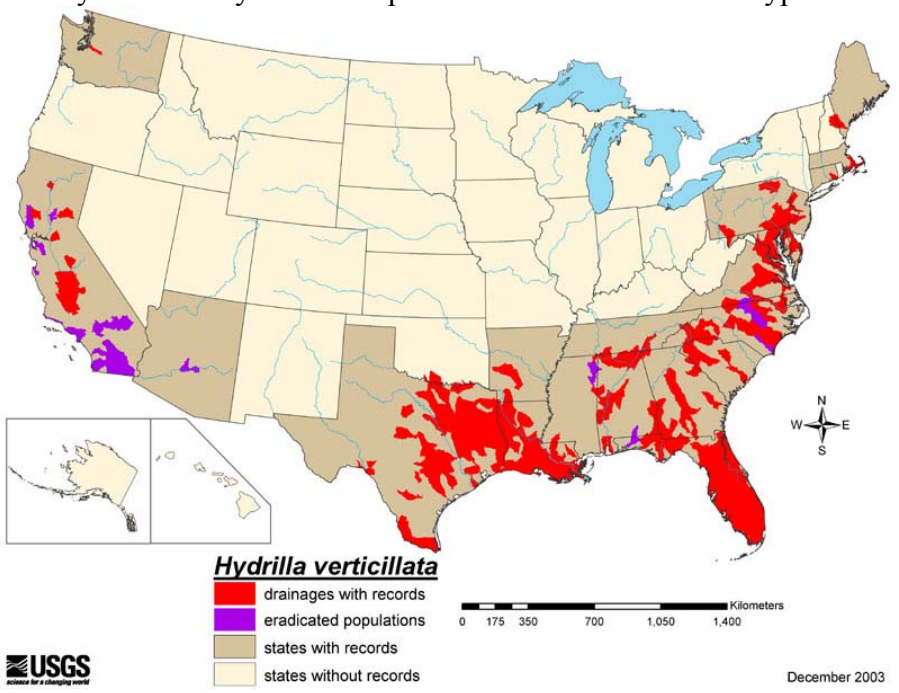


Fig. 28 Known occurrences of Hydrilla in the U.S. in 2003. From the USGS website, http://nas.er.usgs.gov/taxgroup/plants/docs/hy_verti.html

Indiana waterways if Hydrilla is allowed to spread. Like many invasive aquatic plants Hydrilla can form dense surface mats depriving native plant communities of light, decreasing plant community diversity and causing serious impairment of recreational activities including fishing, swimming, and boating.

Fig. 29 Hydrilla mats clog the surface of Lake Conroe Texas. Photo courtesy of Earl Chilton, Texas Parks and Wildlife Department

Hydrilla can spread by fragmentation, or the production of seeds, tubers (root structures), or turions (seed-like plant buds). Because of the potential for spread through fragmentation, plant material hitching a ride on watercraft trailers is probably a major mechanism of introduction. Tubers and turions can be very hearty, surviving dry periods or herbicide treatments and remaining hidden in the lake bottom for extended periods of time. Because of these characteristics great ecological damage and recreational impairment can occur in watersheds colonized by Hydrilla. In 2006 Hydrilla was discovered in Lake Manitou in Rochester Indiana (Fulton County). This is the first known occurrence of this plant in the Midwest. The Indiana Department of Natural Resources has devised a plan for eradicating and controlling the Hydrilla to prevent spread to other water bodies. Checks of other lakes in close proximity to Lake Manitou have not located any other Hydrilla, so it is possible that the plant is only in Lake Manitou at this time. However, it's also possible that other lakes contain young Hydrilla infestations that have yet to be recognized so it's important that associations and lake residents learn to identify this plant. Acting early in spotting Hydrilla can help prevent spread and ultimately prevent a huge toll on the ecology and recreational value of Indiana lakes. Whereas many Steuben County lakes are popular boating and sportfishing destinations there is a definite possibility that this plant could appear in Lake Pleasant in the future. Information on Hydrilla identification should be presented to the Lake Pleasant users at meetings as a regular part of the lake resident educational program.

Fig. 30 Hydrilla is similar in appearance to the native plant Elodea canadensis and also Brazilian elodea, an exotic also recently found in Indiana. It forms long stems containing many whorls of short leaves. Photo Courtesy of Dr. John H. Rodgers, Jr.

11.1.1 Hydrilla Identification

Hydrilla strongly resembles the native aquatic plant Elodea *Elodea canadensis* and the introduced species Brazilian elodea *Egeria Densa.* Both these species can be found in Indiana although the occurrence of Brazilian elodea has been very limited thus far. Native Elodea is a part of the Lake Pleasant plant community. Hydrilla is a long slender plant that sometimes branches and has short leaves arranged around the stem in a star-like (whorled) pattern. Characteristics which differentiate Hydrilla from Elodea and Brazilian Elodea include a typical leaf count of five in the whorl. Brazilian elodea typically has four to six leaves but never three, and native Elodea usually has three. (Fig 31) Small teeth are also present on the midrib of Hydrilla leaves and may give the plant a "rough" feel.

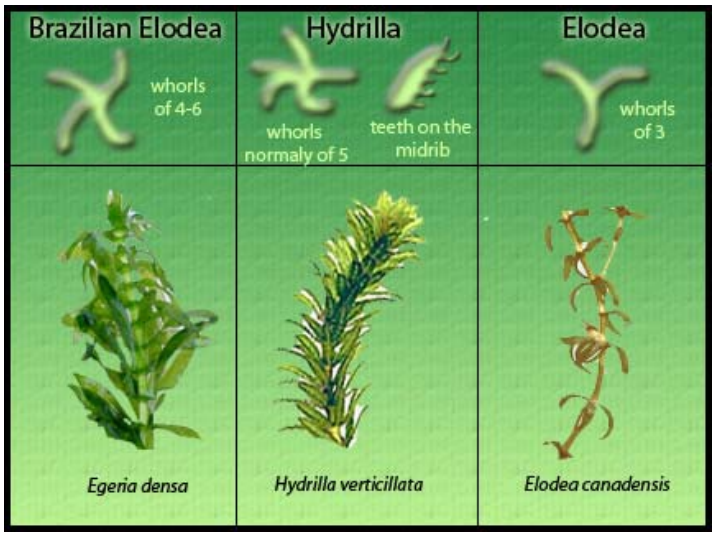


Fig. 31 Brazilian elodea has a typical leaf count of 4-6, while Hydrilla's is usually 5, and Elodea's 3

Photo courtesy of Rob Nelson at ExploreBiodiversity.com

Hydrilla also has small serrations along the leaf edges (fig 32). Another distinguishing characteristic of Hydrilla is the presence of tubers (.2 to .4 inch long off-white structures attached to the root) (fig 33).

Fig. 32 Edges of Hydrilla leaves have fine serrations visible upon close examination

Photo Courtesy of Dr**. John H. Rodgers, Jr.**

Fig. 33 Hydrilla plants with tubers attached. Photo courtesy of King County Natural Resources and Parks, Water and Land Resources Division

Anyone noting the presence of Hydrilla or Brazilian elodea is asked to immediately contact Doug Keller, Invasive species coordinator for the Indiana Department of Natural Resources at 317-234-3883, email: **dkeller@dnr.in.gov**. If you have questions about the identity of aquatic plants found, photos of the plants can be e-mailed to Doug for basic identification to determine if further action is required. More information on stopping the spread of invasive aquatic species is available online at **http://www.protectyourwaters.net/**

12.0 Integrated Management Action Strategy

Based on the value of Lake Pleasant as a unique public resource with three RTE species present in its plant community, the overwhelming desire by its users to continue to control the lake's emerging Eurasian milfoil problem, and the high degree of effectiveness of the 2006 season treatment, it's recommended that the 2006 season's management regime be repeated in 2007. This includes the treatment of up to 25 acres of dense Eurasian watermilfoil growth with 2, 4-D granular aquatic herbicide. Retreatment of up to 25 acres should be planned in case the initial treatment does not have the lasting effect noted during the 2006 season. The lake association should discuss the possibility of establishing a basic screening process for boats entering through its two access points. Monitoring and aquatic plant surveys per the 2007 IDNR protocol should be used to evaluate changes in the lake's plant community and treatment effectiveness. At least one public meeting should be dedicated to help educate the lake residents and allow for the collection of ideas and opinions from lake users and the general public. Because the extensive colonization of Lake Pleasant's riparian wetlands by Purple loosestrife could have implications for water quality, a basic survey should be planned in 2007 to evaluate the colonization of Lake Pleasant's shoreline and riparian wetlands by Purple Loosestrife. Residents should be reminded to take basic efforts to control these plants along their own shoreline. This survey should be designed to evaluate the feasibility of a lake-wide or watershed-wide control program for this invasive plant.

13.0 Estimated Project Budget and Timeline

2007

-June 2007 hold public meeting to discuss plan with community and lake users
$200.00

- May 2007 Map Exotic Plants and Designate Treatment areas
$900.00

-Mid to late May 2007 2-4-D treatment to designated areas maximum 25 acres
$10900.00

-July 2007 Tier II Plant Survey, Designate any retreatment areas
$1113.00

-July 2007 Basic shoreline survey of Purple loosestrife
$300.00

-July 2007 2-4-D treatment to designated areas of re-growth, maximum 25 acres
$10900.00

-November 2007 AVMP document preparation
$600.00

2007 Total $24913.00

14.0 References Cited

Pearson, J. 2004, A sampling method to assess occurrence, abundance and distribution of submersed aquatic plants in Indiana lakes, Indiana Department of Natural Resources, Division of Fish and Wildlife, Tri-Lakes Fisheries Station, 5570 North Hatchery Road Columbia City, Indiana 46725

IDNR 2004. Procedure manual for surveying aquatic egetation: Tier I and Tier II, Indiana Department of Natural Resources, Indianapolis, Indiana.

Aquatic Enhancement & Survey, Inc. 2006. Aquatic Plant Management Plan, Lake Pleasant, Steuben County, Indiana, 2006-2010. Aquatic Enhancement & Survey, Inc., 207 Hoosier Dr., Angola, IN 46703

15.0 Appendices

Appendix A Tier I Data Sheets 5/06

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 1 of __

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 5/20/01

SITE INFORMATION

Plant Bed ID: 1

Bed Size: .82 ac

Substrate: 3

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

CanopyAbundance at Site

S: N: F: E: 1

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

SPECIES INFORMATION

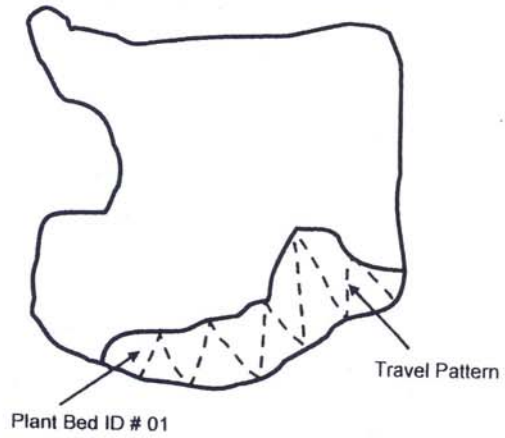
Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	2			
POIL				
POCR3 ✓	3			
MYSP2 ✓	3			
POGR				
PORI ✓	2			
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP. ✓	1			
LYSA ✓	1			
NYTU ✓	2			
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

ALG ✓

NLPW VOUCHER TAKEN ✓ 1

PUSILLUS

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 1 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 2
Bed Size: 3 AC
Substrate: 3
Marl? 0
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
Canopy Abundance at Site
S: N: F: E:

SITE COORDINATES

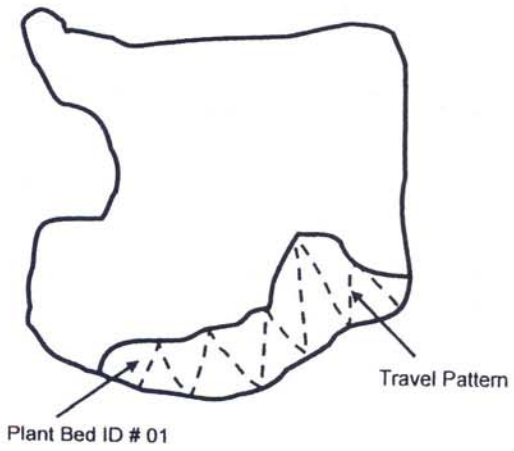
Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

AEG.

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA	3			
POIL	2			
POCR3	2			
MYSP2	2			
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SAGI				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:
23' secchi Depth

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page 9 of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 3
Bed Size: 46.95 AC
Substrate: 2
Marl? 0
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
Canopy Abundance at Site: S: N: F: E:

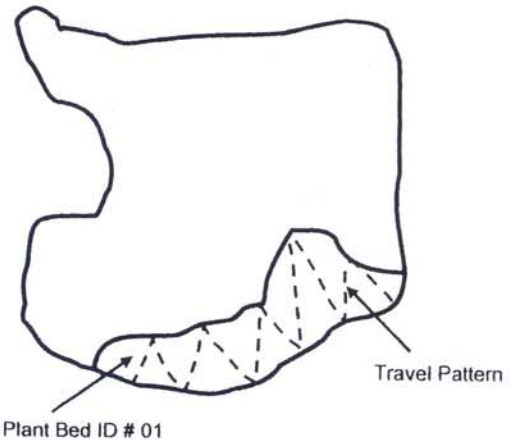
SITE COORDINATES

Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ?AR ✓	4			
POIL ✓	2			
POCR3 ✓	2			
MYSP 2 ✓	2			
POGR				
PORI				
UTMA ✓	1			
NAFL				
POPR5 ✓	2			
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:
8-13'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page 10 of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 4
Bed Size: 16.57AC
Substrate: 2
Marl? 0
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species

CanopyAbundance at Site

S:	N:	F:	E:

SITE COORDINATES

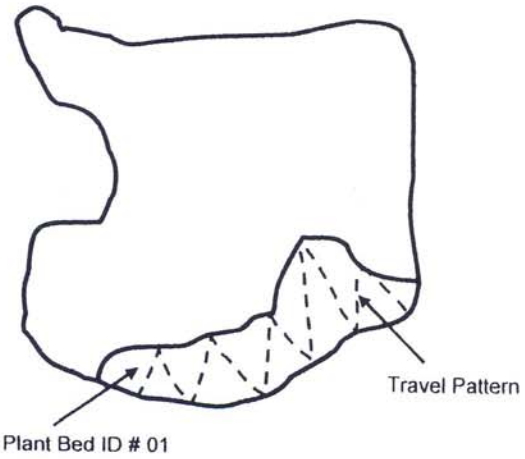
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	4			
POIL				
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NYLU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

13' - 18'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifiec

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.	DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 5	Waterbody Name: LAKE PLEASANT			
Bed Size: .44 Ac				
Substrate: 2	Waterbody ID:			
Marl? 0	Total # of Species			
High Organic? 1	Canopy Abundance at Site			
	S:	N:	F:	E: 2

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓				
POIL ✓	1			
POCR3				
MYSP 2 ✓	2			
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MYVE ✓	3			
POPE6 ✓	2			
POZO				
CEDE ✓				
POAM ✓	2			
SC SP. ✓	2			
LYSA ✓				
NYTU ✓	2			
SA SP.				
ARVM				
NULU				
TYLA ✓	1			
TYAN				

AEGA ✓ 1

POCH ✓ 2

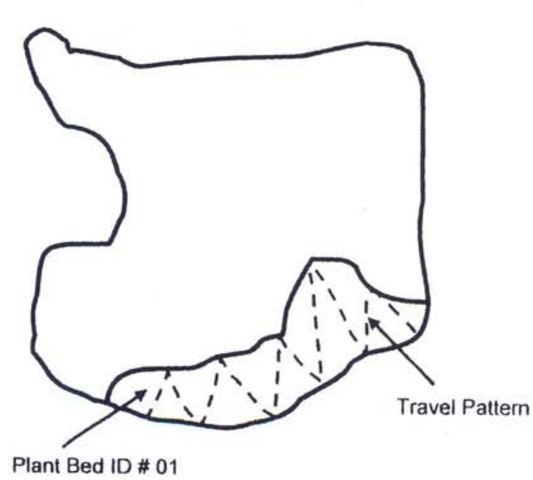
? in Bush 2

Willow ✓ 1

IRVI ✓ 2

CAREX SP. ✓ 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
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1 = Taken, not varified
2 = Taken, varifiex

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 1b

Bed Size: 2.56 AC

Substrate: 2

Marl? 0

High Organic? 1

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

Canopy Abundance at Site

S: N: F: E: 1

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

SPECIES INFORMATION

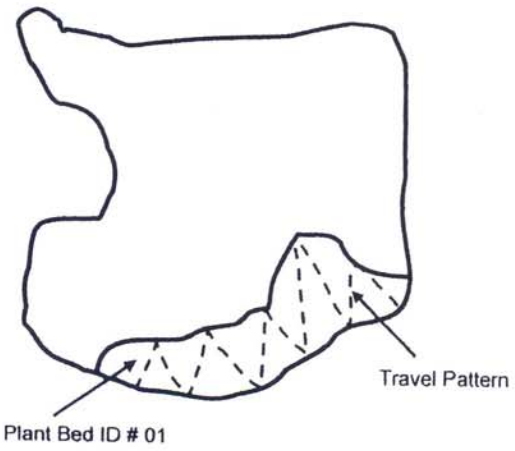
Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	2			
POIL ✓	2			
POCR3 ✓	2			
MYSP 2 ✓	3			
POGR				
PORI				
UTMA ✓	2			
NAFL				
POPR 5				
MYVE				
POPE6 ✓	2			
POZO ✓	2			
CEDE				
POAM				
SC SP. ✓	2			
LYSA				
NYTU ✓	2			
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

AMGA ✓ 1

PHAR ✓ 1

EUNA SP. ✓ 1

Individual Plant Bed Survey



Comments:

thick milfoil

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
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2 = 2-20%
3 = 21-60%
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
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2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/04

SITE INFORMATION

Plant Bed ID: 7
Bed Size: .25 AC
Substrate: 3
Marl? 0
High Organic? 6

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species

CanopyAbundance at Site

S: N: F: E:

SITE COORDINATES

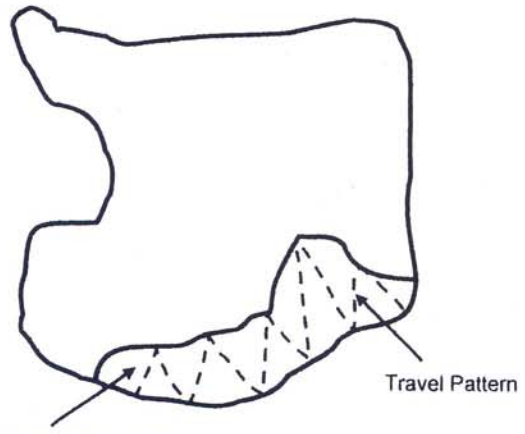
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL				
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP. ✓	2			
LYSA				
NYTU				
SA SP.				
ARVM				
NYLU ✓	2			
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:
West of MAP position

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifiec

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 8
Bed Size: .27AC
Substrate: 2
Marl? 0
High Organic? 1
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
Canopy Abundance at Site: S: N: F: E: 2

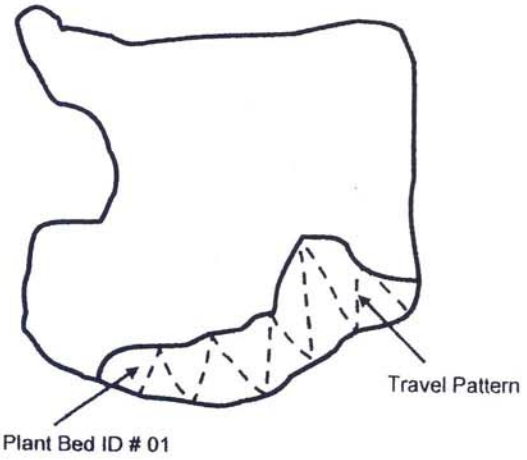
SITE COORDINATES

Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	2			
POIL ✓	2			
POCR3 ✓	1			
MYSP2 ✓	3			
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE ✓	2			
POPE6 ✓	2			
POZO				
CEDE				
POAM				
SCSP. ✓	2			
LYSA				
NYTU ✓	2			
SA SP.				
ARVM				
NULU ✓	1			
TYLA ✓	1			
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 8.5
Bed Size: 7.2 AC.
Substrate: 2
Marl? 1
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

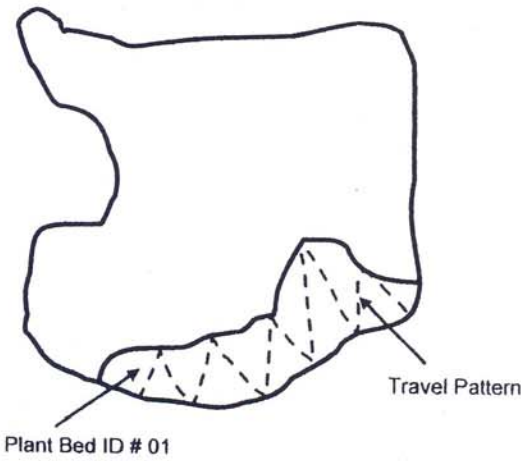
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	2			
POIL				
POCR3				
MYSP2 ✓	3			
POGR				
PORI ✓	2			
UTMA				
NAFL				
POPR5 ✓	2			
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SASP.				
ARVM				
NYLU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 9

Bed Size: 54.68 AC.

Substrate: 2

Marl? 1

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

CanopyAbundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

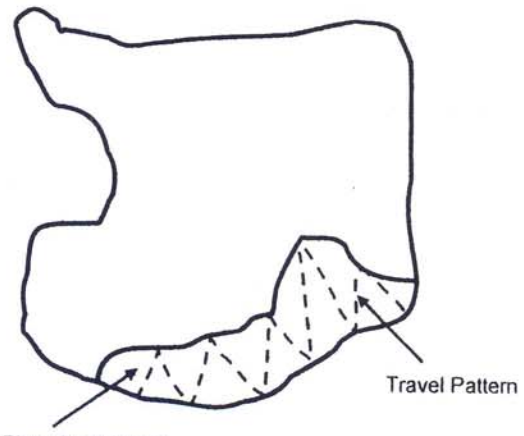
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	3			
POIL ✓	2			
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA ✓	1			
NAFL				
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NYLU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

4½ - 8'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 10
Bed Size: .85 AC.
Substrate: 3
Marl? 0
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

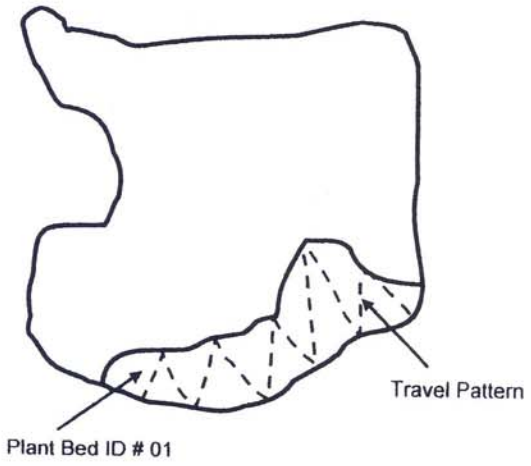
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	2			
POIL ✓	3			
POCR 3				
MYSP 2 ✓	2			
POGR ✓	1			
PORI ✓	2			
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6 ✓	2			
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
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QE Code:
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 11

Bed Size: 98,394 ac.

Substrate: 3

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

CanopyAbundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

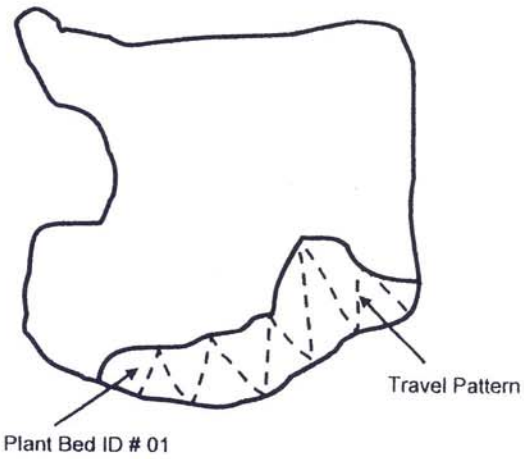
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	1			
POIL ✓	1			
POCR3				
MYSP2				
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP. ✓	2			
LYSA				
NYTU				
SA SP.				
ARVM				
NYLU				
TYLA ✓	2			
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
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4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
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High Organic
1 = Present
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Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
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Canopy:
1 = < 2%
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3 = 21-60%
4 = > 60%

Abundance:
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QE Code:
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
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Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/04

SITE INFORMATION

Plant Bed ID: 12

Bed Size: 8.94AC

Substrate: 2

Marl?

High Organic? 1

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

Canopy Abundance at Site

S: N: F: E: 3

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

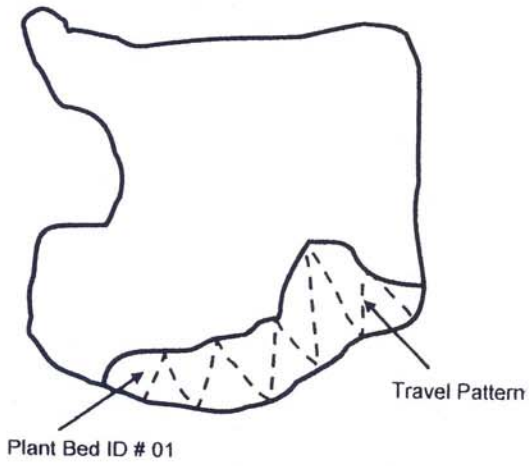
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL ✓	2			
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA ✓	1			
NAFL				
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU ✓	4			
SA SP.				
ARVM				
NULU				
TYLA ✓	2			
TYAN				

PLNA ✓

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
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5 = Gravel/Rock
6 = Sand

Marl
1 = Present
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High Organic
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N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 13
Bed Size: 20 AC.
Substrate: 2
Marl? 0
High Organic? 1
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
CanopyAbundance at Site
S: N: F: E: 2

SITE COORDINATES

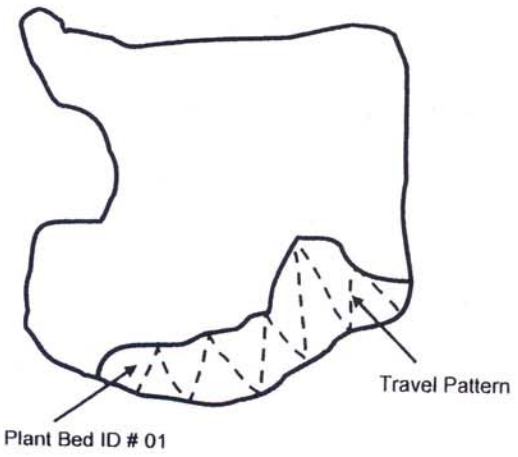
Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL ✓	2			
POCR3 ✓	2			
MYSP 2				
POGR				
PORI				
UTMA ✓	2			
NAFL				
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU ✓	3			
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

ALAG. ✓ 2

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 14
Bed Size: .3ac
Substrate: 2
Marl? 0
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
Canopy Abundance at Site: S: N: F: E: 2

SITE COORDINATES

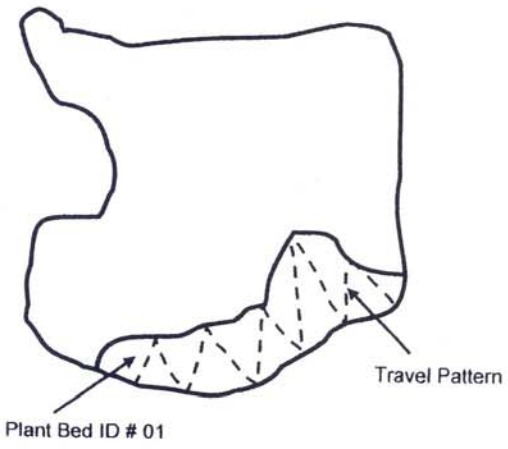
Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	2			
POIL ✓	3			
POCR3				
MYSP2 ✓	3			
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE ✓	2			
POPE6				
POZO				
CEDE				
POAM ✓	2			
SCSP. ✓	2			
LYSA				
NYTU ✓	2			
SA SP.				
ARVM				
NULU				
TYLA ✓	2			
TYAN				

POCHV
PONAV
2

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 5/24/06

SITE INFORMATION

Plant Bed ID: 18

Bed Size: 6.93 AC.

Substrate: 2

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

CanopyAbundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

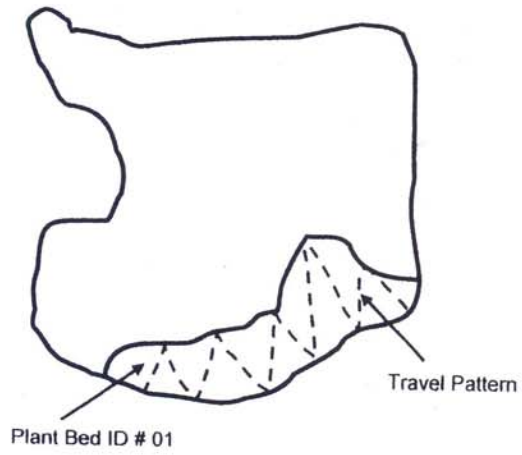
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	3			
POIL ✓	2			
POCR3 ✓	2			
MYSP 2 ✓	2			
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:
8-13'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 19
Bed Size: 3.97
Substrate: 2
Marl? 6
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
Canopy Abundance at Site: S: N: F: E:

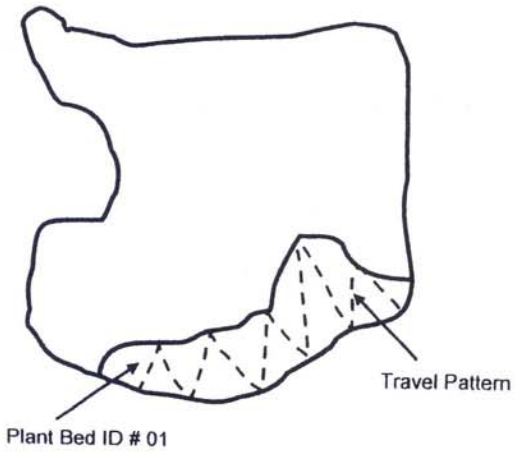
SITE COORDINATES

Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	3			
POIL				
POCR3 ✓	2			
MYSP2 ✓	1			
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NYLU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

13'-18'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page 4 of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/20/06

SITE INFORMATION

Plant Bed ID: 20
Bed Size: 15.82
Substrate: 2
Marl? 1
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species

CanopyAbundance at Site

S:	N:	F:	E:

SITE COORDINATES

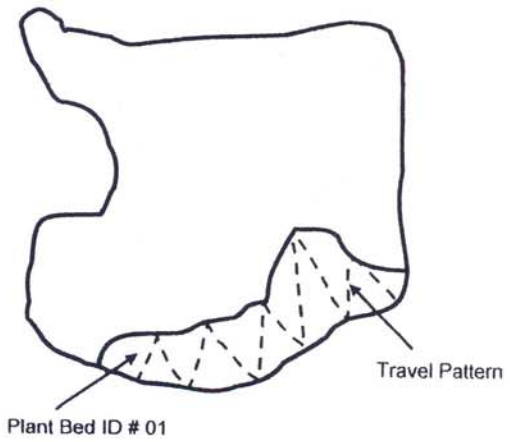
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR	3			
POIL				
POCR3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:
18'-26'
channa down to 25'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 7 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 5/19/06

SITE INFORMATION

Plant Bed ID: CH1

Waterbody Name: LAKE PLEASANT

Bed Size: 8.54C

Substrate: 2

Waterbody ID:

Marl? 0

Total # of Species

High Organic? 1

Canopy Abundance at Site: S: N: F: E: 4

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ?AR ✓	2			
POIL				
POCR3 ✓	3			
MYSP 2 ✓	3			
POGR ✓	2			
PORI ✓	1			
UTMA ✓	2			
NAFL				
POPR 5				
MYVE ✓	2			
POPE6 ✓	2			
POZO				
CEDE				
POAM ✓	2			
SCSP. ✓	3			
LYSA				
NYTU ✓	3			
SA SP. ✓	2			
ARUM				
NULU ✓	2			
TYLA ✓	2			
TYAN				

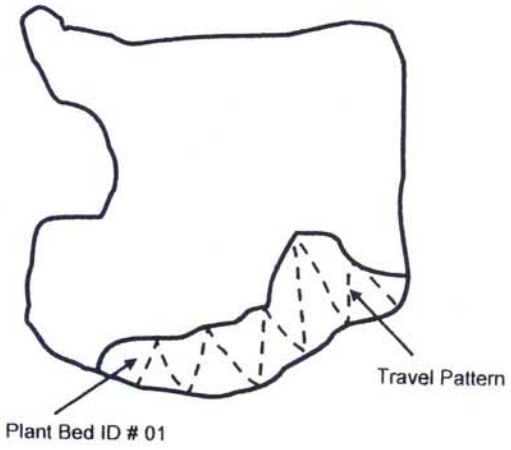
ALG ✓ 3

YELLOW FLAG ✓ IRIS 2

SMTWD 2 ✓

INC. WETLAND

Individual Plant Bed Survey



Comments:

MYSP & POCR THICK & NEAR SURFACE SOUTH OF THE BRIDGE

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 6 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/19/06

SITE INFORMATION

Plant Bed ID: CH 2
Bed Size: .63 AC
Substrate: 3
Marl? 0
High Organic? 1
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
CanopyAbundance at Site: S: N: F: E: 1

SITE COORDINATES

Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

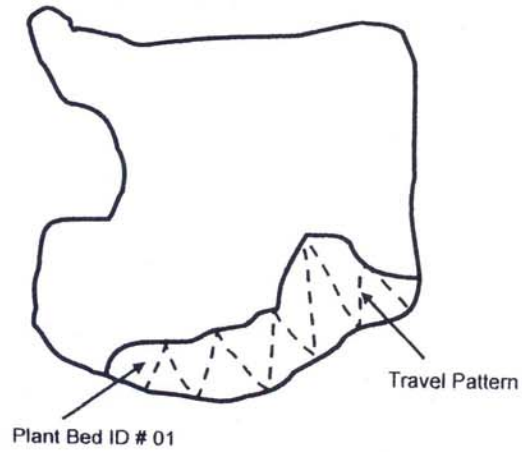
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR	2			
POIL ✓	1			
POCR3 ✓	2			
MYSP 2 ✓	3			
POGR ✓	2			
PORI ✓	1			
UTMA				
NAFL				
POAR 5				
MYVE ✓	2			
POPE6 ✓	2			
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NYLU				
TYLA				
TYAN				

HORNED P.W. ✓ 2

POCA ✓ 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 5 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 5/19/06

SITE INFORMATION

Plant Bed ID: CH3

Bed Size: .77AC.

Substrate: 3

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

CanopyAbundance at Site

S: N: F: E: 1

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

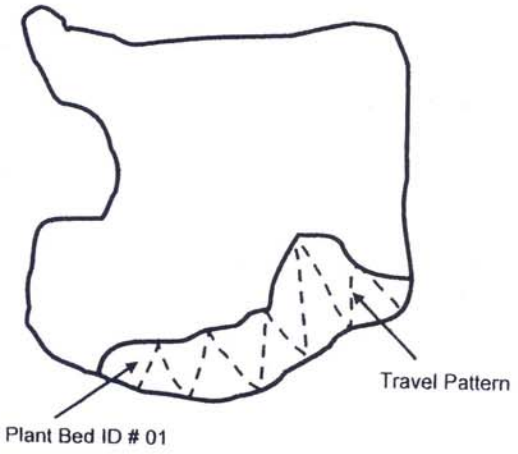
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	4			
POIL ✓	1			
POCR3	2			
MYSP2 ✓	2			
POGR ✓	2			
PORI ✓	2			
UTMA				
NAFL				
POPR5				
MYVE ✓	2			
POPE6 ✓	2			
POZO				
CEDE				
~~POAM ✓~~				
SCSP.				
LYSA				
NYTU ✓	1			
SA SP. ✓	1			
ARVM				
NULU				
TYLA				
TYAN				

ALG ✓

POCH ✓

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 4 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 5/19/06

SITE INFORMATION

Plant Bed ID: CH 4
Bed Size: .88
Substrate: 3
Marl? 0
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species
Canopy Abundance at Site: S: N: F: E: 21

SITE COORDINATES

Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

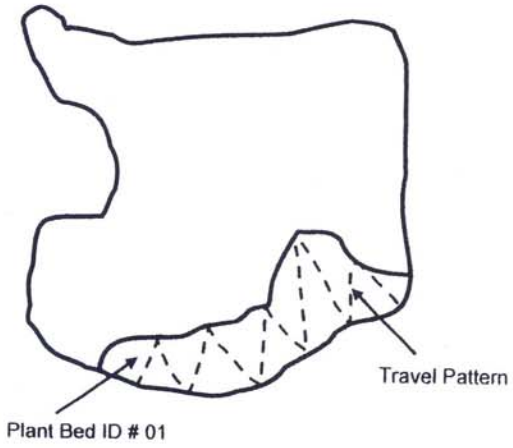
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	2			
POIL				
POCR3 ✓	1			
MYSP2 ✓	3			
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE ✓	2			
POPE6 ✓	3			
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU ✓	2			
SASP. ✓	1			
ARVM				
NYLU				
TYLA				
TYAN				

ALG ✓ 3

POCH ✓

Individual Plant Bed Survey



Comments:

VERY WINDY/CLOUDY

SECHI 23.6 FT

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
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1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 3 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: CH 5

Waterbody Name: LAKE PLEASANT

Bed Size: .46

Substrate: 3

Waterbody ID:

Marl? 0

Total # of Species

High Organic? 0

Canopy Abundance at Site

S: N: F: E: 2

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

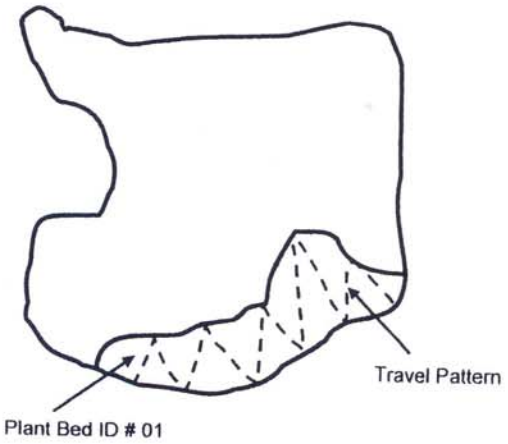
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
~~NUPU VAR. 2~~ ✓				
CHARA ✓	3			
POIL ✓	2			
POCR3				
MYSP 2 ✓	2			
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MYVE ✓	2			
POPE6 ✓	3			
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU ✓				
SA SP.				
ARVM				
NYLU				
TYLA ✓				
TYAN				

ALG ✓ 3

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page 2 of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: CH 6

Bed Size: .65 AC

Substrate: 3

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species

Canopy Abundance at Site

S: N: F: E: 1

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

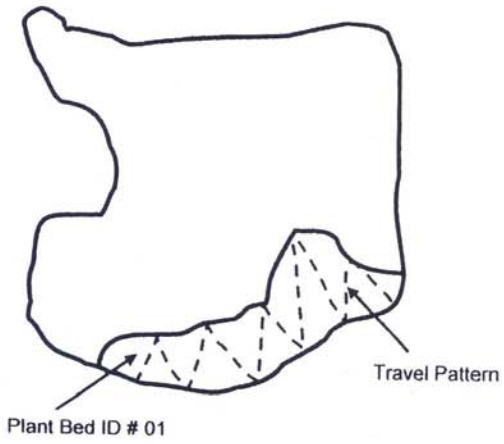
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	2			
POIL				
POCR 3 ✓	2			
MYSP 2 ✓	3			
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MYVE				
POPE 6 ✓	1			
POZO				
CEDE				
POAM				
SCSP. ✓	1			
LYSA				
NYTU ✓	1			
SA SP. ✓	1			
ARVM				
NULU				
TYLA				
TYAN				

~~NFW VOUCHER 2 TAKEN~~

Individual Plant Bed Survey



Comments:

WATER TEMP 62°

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Appendix B Tier I Data Sheets 8/06

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/3/06

SITE INFORMATION

Plant Bed ID: 1

Bed Size:

Substrate: 3

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 45 2 E

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

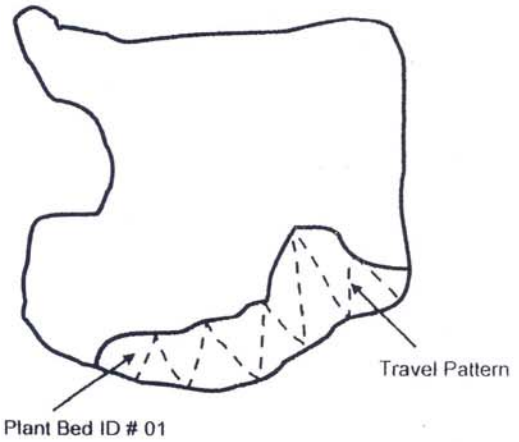
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL				
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6	3			
POZO				
CEDE	3			
POAM				
SC SP.	2			
LYSA				
NYTU	2			
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

VAAM 2
NAFL 3

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page __ of __

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 1A

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate: 3

Waterbody ID:

Marl? 2

Total # of Species 45

High Organic? 0

Canopy Abundance at Site

S: 1 N: F: E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

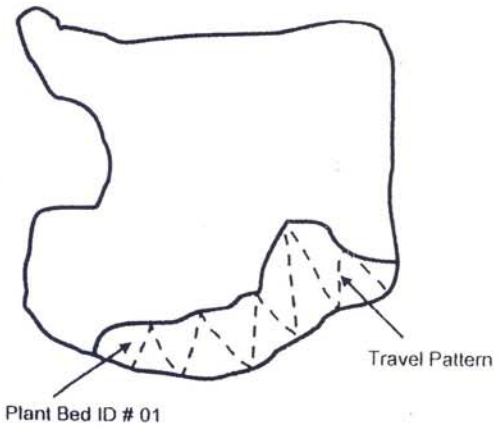
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARL	2			
POIL	3			
POCR3				
MYSP2				
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6	2			
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SASP.				
ARVM				
NULU				
TYLA				
TYAN				

MAL 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
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1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 2

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate: 3

Waterbody ID:

Marl? 0

Total # of Species 65

High Organic? 0

Canopy Abundance at Site

S: 1 N: F: E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

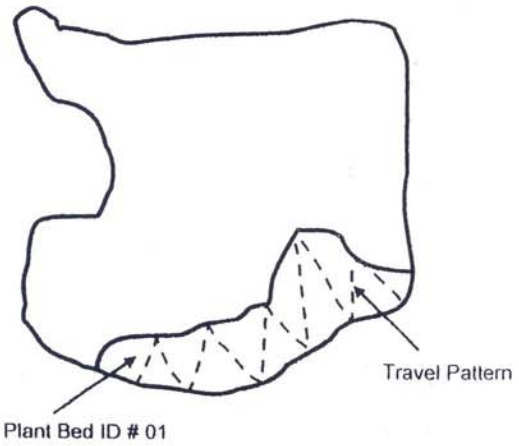
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	3			
POIL ✓	3			
POCR3				
MYSP 2				
POGR ✓	3			
PORI ✓	2			
UTMA				
NAFL				
POPR 5				
MYVE				
POPE6 ✓	2			
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

VAAM ✓ 2

Individual Plant Bed Survey



Comments:

MARINA & SWP FRONTAGE

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
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3 = 21-60%
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QE Code:
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1 = Species suspe
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3 = Unknown

Voucher:
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1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

SPANY 2
VAAM 2

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 8/3/06

SITE INFORMATION

Plant Bed ID: 2A

Waterbody Name: LAKE PLEASANT

Bed Size: .30 AC.

Substrate: 3

Waterbody ID:

Marl? 0

Total # of Species 65

High Organic? 0

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

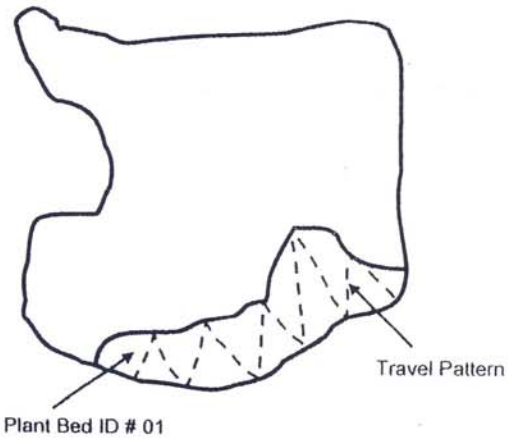
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR'	3			
POIL	3			
POCR3				
MYSP 2				
POGR				
PORI	3			
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6	2			
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

VAAM ✓ 2

SITE INFORMATION

Plant Bed ID: 3

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate:

Waterbody ID:

Marl?

Total # of Species

High Organic?

Canopy Abundance at Site

S: N: F: E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

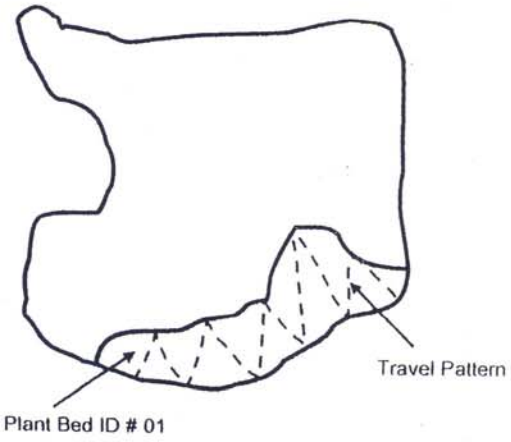
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARL	4			
POIL ✓	2			
POCR3				
MYSP 2				
POGR				
PORI ✓	1			
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARUM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

8'-13' EAST

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 4

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate: 2

Waterbody ID:

Marl? 0

Total # of Species

High Organic? ~~0~~ 1

CanopyAbundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

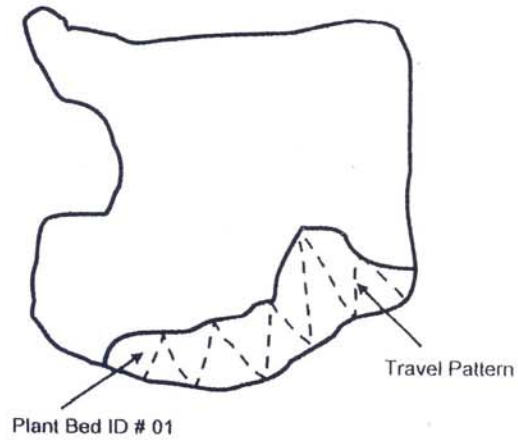
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	2			
POIL				
POCR 3.				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL ✓	1			
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

13' - 18 EAST

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page __ of __

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 5

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate: 2

Waterbody ID:

Marl? 0

Total # of Species 55 4E

High Organic? 1

Canopy Abundance at Site

S: N: F: E: 3

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

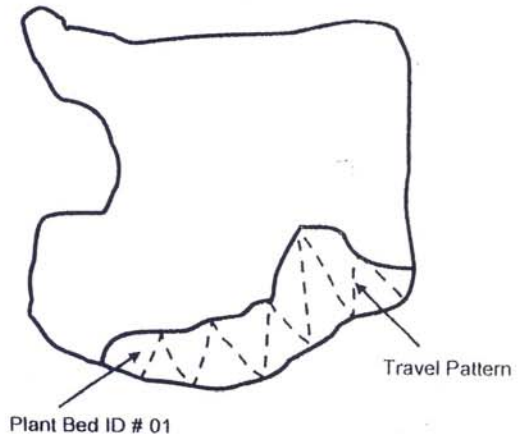
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARAM ✓	1			
CHAR-G ✓	2			
POIL ✓	2			
POCR3				
MYSP 2 ✓	1			
POGR ✓	2			
PORI				
UTMA				
NAFL ✓	2			
POPR5				
MYVE				
POPE6 ✓	2			
POZO				
CEDE				
POAM				
POOO ✓				
SCSP. ✓				
LYSA ✓				
NYTU ✓				
SA SP.				
ARUM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

"L" CHANNEL NEAR SE CORNER

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 6

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate:

Waterbody ID:

Marl?

Total # of Species 7S 1E

High Organic? 1

Canopy Abundance at Site

S: N: F: E: 1

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

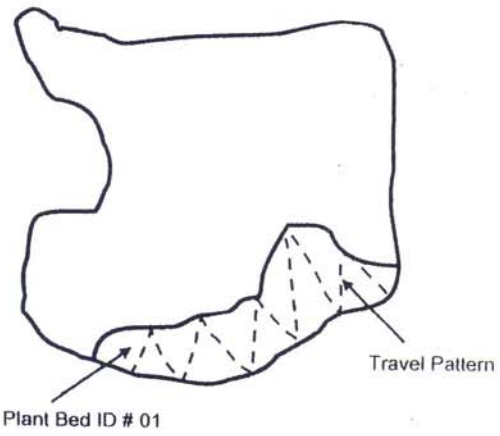
Longitude:

SPECIES INFORMATION

VAAM ✓ 2

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	3			
POIL ✓	2			
POCR3				
MYSP 2 ✓	1			
POGR ✓	2			
PORI				
UTMA ✓	2			
NAFL				
POAR5				
MYVE				
POPE6 ✓	2			
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU ✓	21			
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

VERY LITTLE REGROWTH
- JUST A FEW MYSP
- GOOD PONDWEEDS

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
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2 = 2-20%
3 = 21-60%
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Abundance:
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1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 7

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate:

Waterbody ID:

Marl?

Total # of Species 2F 1S

High Organic?

Canopy Abundance at Site

S:	N:	F:	E: 2

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

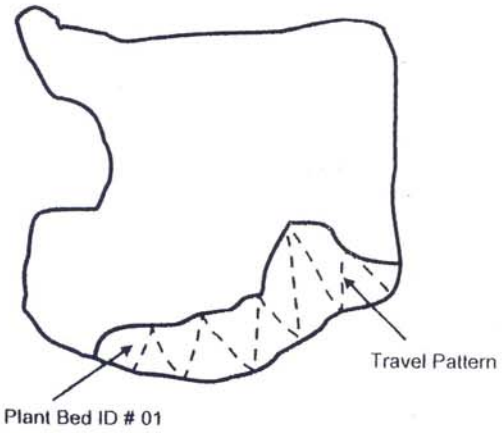
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	1			
POIL				
POCR3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP. ✓	2			
LYSA				
NYTU				
SA SP.				
ARVM				
NULU ✓	2			
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

SMALL NUPHAR PATCH BY AL'S

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
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2 = 2-20%
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4 = > 60%

Abundance:
1 = < 2%
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3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 8

Bed Size:

Substrate: 2

Marl? 0

High Organic? A

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 105 85

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

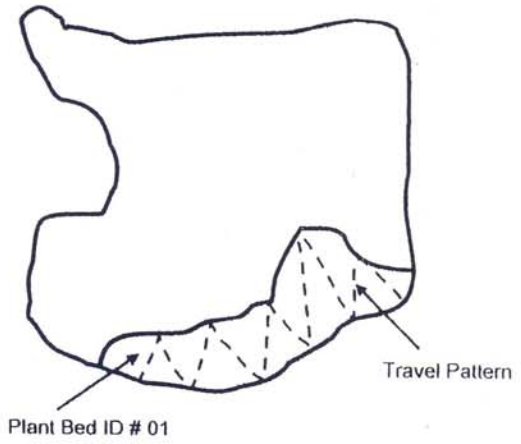
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ?AR ✓	2			
POIL ✓	2			
POCR3				
MYSP 2 ✓	3			
POGR ✓	2			
PORI				
UTMA ✓	2			
NAFL ✓	4			
POPR 5				
MYVE ✓	2			
POPE6 ✓	3			
POZO				
CEDE				
POAM				
SC SP.				
LYSA ✓ 2				
NYTU ✓ 3				
SA SP.				
ARVM				
NULU ✓ 2				
TYLA ✓ 2				
TYAN				

POZO ✓ 2
ELCA ✓ 1

SASP. ✓ 1
POO ✓ 2
SC SP. ✓ 2
RVI ✓ 1

Individual Plant Bed Survey



Comments:

AL'S CHANNEL

- SUBSTANTIAL MYSP REGROWTH

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 8.5
Waterbody Name: LAKE PLEASANT
Bed Size:
Substrate: 3
Waterbody ID:
Marl? ~~0~~
Total # of Species 55
High Organic? 0

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed
Latitude:
Longitude:

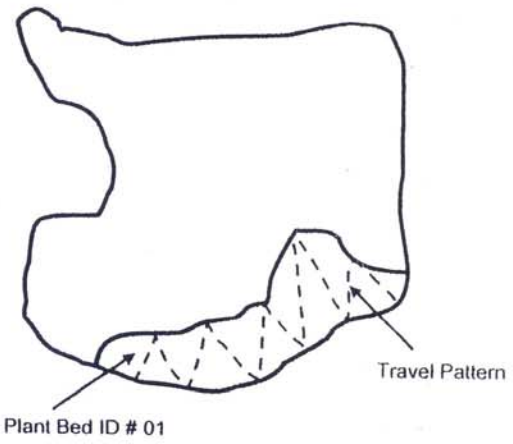
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA	1			
POILL	3			
POCR3				
MYSP 2				
POGR				
PORIL	3			
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

SPINY 4
NAMU 2

Individual Plant Bed Survey



Comments:

TONS OF SPINY NAIAD

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 9

Bed Size: 54.64

Substrate: 3

Marl? 01

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 55

Canopy Abundance at Site

S: 1 N: F: E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

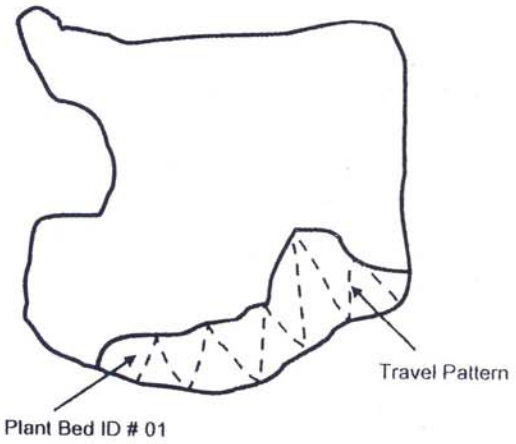
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL	3			
POCR 3				
MYSP 2				
POGR				
PORI	1			
UTMA				
NAFL	2			
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

VAAM 2

STAR 2

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species, referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: ~~10~~ 11

Bed Size: 98.39

Substrate:

Marl? 1

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 25 ~~32~~

CanopyAbundance at Site

S:	N:	F:	E: 2

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

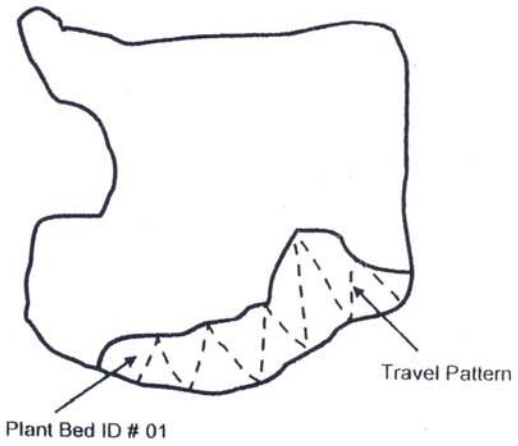
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	1			
POIL ✓	1			
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POFR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SCSP. ✓ 3				
LYSA ✓ 1				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA ✓ 1				
TYAN				

POCO ✓

Individual Plant Bed Survey



Comments:

0'-4.5'

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page __ of __

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE:

SITE INFORMATION

Plant Bed ID: 12

Bed Size: 4.94

Substrate: 1

Marl? 0

High Organic? 1

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 55 4E

CanopyAbundance at Site

S: N: F: E: 3

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

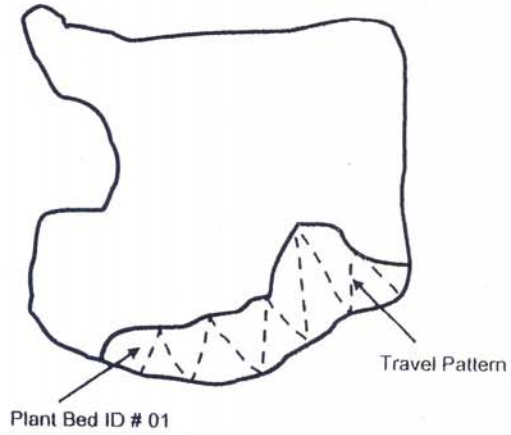
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL ✓	3			
POCR 3				
MYSP 2				
POGR ✓	2			
PORI				
UTMA ✓	1			
NAFL				
POPR 5				
MYVE				
POPE 6 ✓	1			
POZO				
CEDE				
POAM				
SC SP. ✓	1			
LYSA ✓				
NYTU ✓	3			
SA SP.				
ARVM				
NULU				
TYLA ✓	2			
TYAN				

PONA ✓ 2 (FLOATING)

VEFOVE RYSU ✓ 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

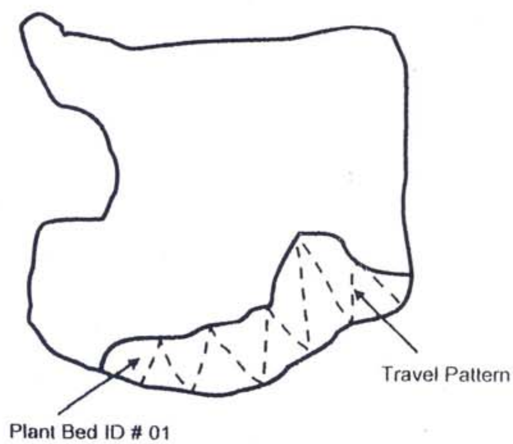
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE:
SITE INFORMATION				**SITE COORDINATES**
Plant Bed ID: 13	Waterbody Name: LAKE PLEASANT			Center of the Bed
Bed Size: 20				Latitude:
Substrate: 1	Waterbody ID:			Longitude:
Marl? 0	Total # of Species 3 5			Max. Lakeward Extent of Bed
High Organic? 1	Canopy Abundance at Site			Latitude:
	S: 1	N:	F:	E: 3	Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH?AR ✓	3			
POIL ✓	3			
POCR 3				
~~MYSP 2 ✓~~	~~1~~			
POGR				
PORI				
UTMA ✓	3			
NAFL				
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA ✓	1			
NYTU	✓ 3			
SA SP.				
ARVM				
NULU				
TYLA	✓ 2			
TYAN				

Margin notes: ALGA 1; UNK 2 ★ (... SAMPLES); ..°45.20N; ..5° 06.52W; P.. & U NEAR - SILT ORGANIC; SWAMP ... ✓ 1

Individual Plant Bed Survey



Comments:

REDWATER LK

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 14

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate: 2 3

Waterbody ID:

Marl? 0

Total # of Species 3 S 2 E

High Organic? 0

Canopy Abundance at Site

S: T N: F: E: 2

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

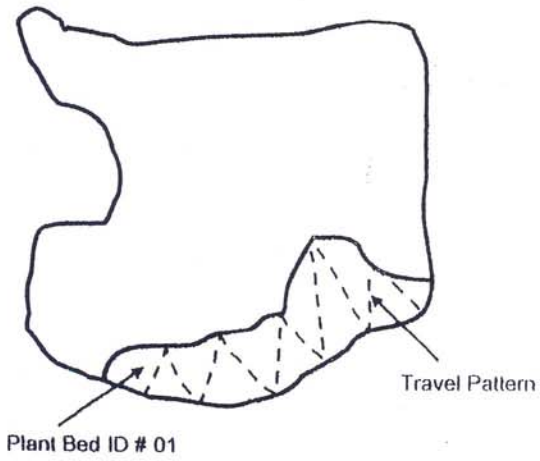
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	4			
POIL ✓	2			
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL ✓	1			
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP. ✓	2			
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA ✓	2			
~~TYAN~~				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 15
Bed Size: 3.14 AC.
Substrate: 2
Marl? 0
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species 35

Canopy Abundance at Site

S:	N:	F:	E:
+			

SITE COORDINATES

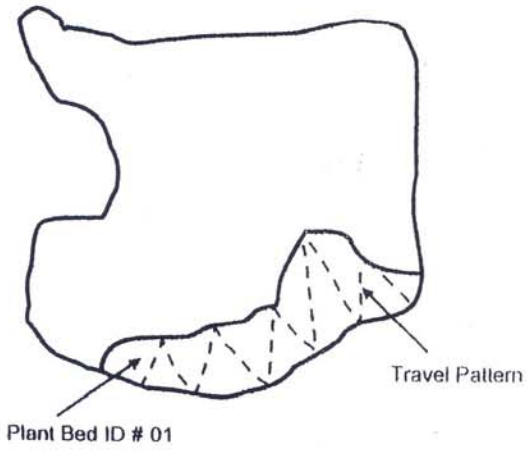
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	3			
POIL				
POCR3				
MYSP2				
POGR ✓	2			
PORI				
UTMA				
NAFL ✓	2			
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

4.5-8 NW

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page ___ of ___

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 16

Bed Size: 3.34

Substrate: 3

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 35

Canopy Abundance at Site

S: T N: F: E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

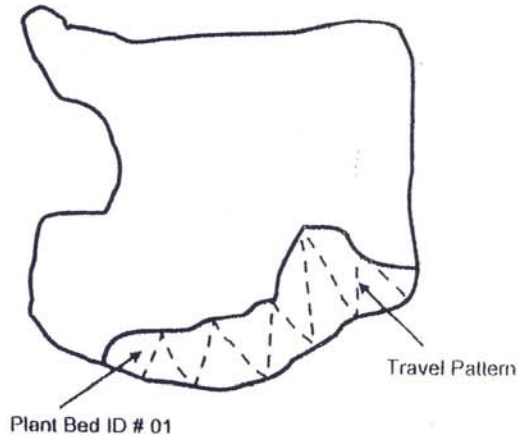
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	3			
POIL ✓	2			
POCR3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL ✓	2			
POFR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

4.5-8 SW

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 17

Bed Size: 5-9

Substrate: 2

Marl? 0

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 65

Canopy Abundance at Site

S: 1 | N: | F: | E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

Longitude:

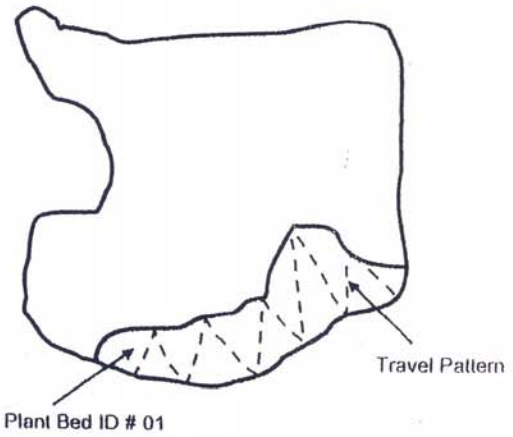
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ?AR ✓	3			
POIL ✓	3			
POCR3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR5 ✓	1			
MYVE				
POPE6 ✓	1			
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

SPINY NAIAD 2

VAAM 1

Individual Plant Bed Survey



Comments:

4.5-8 WEST END

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 18

Bed Size: 6-93

Substrate: 2

Marl? ~~0~~ 1

High Organic? 0

Waterbody Name: LAKE PLEASANT

Waterbody ID:

Total # of Species 49

Canopy Abundance at Site

S: T | N: | F: | E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

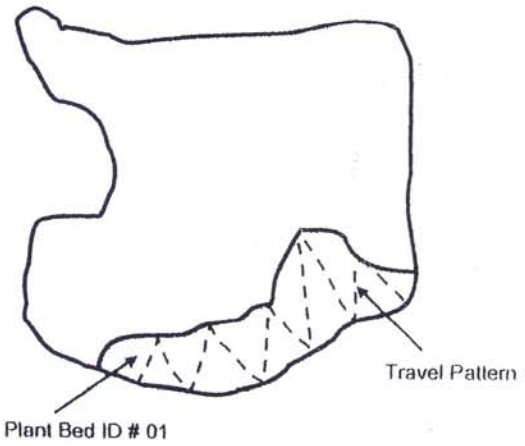
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHTAR	3			
POIL	2			
POCR3				
MYSP2				
POGR				
PORI				
UTMA				
NAFL	2			
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SASP.				
ARVM				
NULU				
TYLA				
TYAN				

SPIKE 2

Individual Plant Bed Survey



Comments:

8-13 WEST

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 19
Waterbody Name: LAKE PLEASANT
Bed Size:
Substrate: 2
Waterbody ID:
Marl? 0
Total # of Species 15
High Organic? 0
Canopy Abundance at Site
S: + N: F: E:

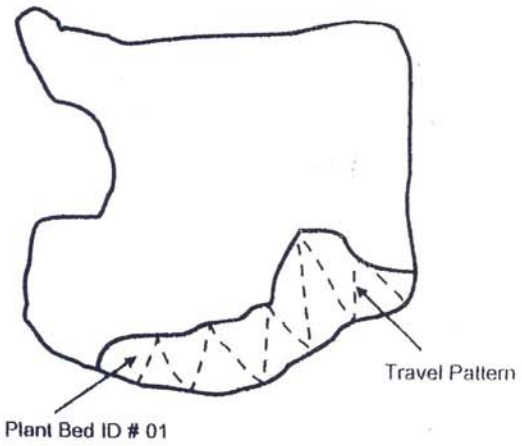
SITE COORDINATES

Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHZAR ✓	2			
POIL				
POCR3				
MYSP2				
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP.				
LYSA				
NYTU				
SASP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

13-18 WEST

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: 20

Waterbody Name: LAKE PLEASANT

Bed Size:

Substrate: 2

Waterbody ID:

Marl? 0

Total # of Species 35

High Organic? 0

Canopy Abundance at Site

S: + N: F: E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

Latitude:

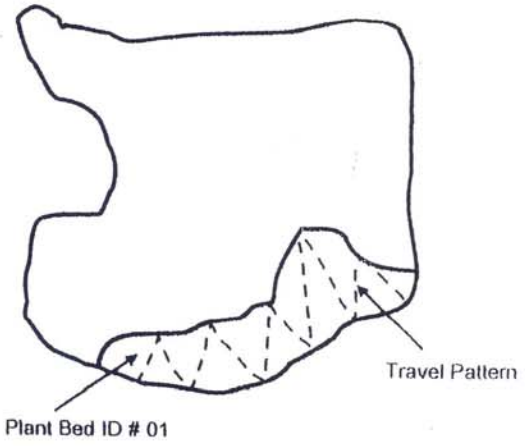
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA	2			
POIL				
POCR3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POAR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SC SP.				
LYSA				
NYTU				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

SPINY ✓ 1
NAIAD
CHARA ✓ 1

Individual Plant Bed Survey



Comments:

18-26

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not verified
2 = Taken, verifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

Page __ of __

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/3/06

SITE INFORMATION

Plant Bed ID: CH1
Bed Size: 8.5
Substrate: 2
Marl? 0
High Organic? 1

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species 115 9E

Canopy Abundance at Site: S: 1 N: F: E: 3

SITE COORDINATES

Center of the Bed
Latitude:
Longitude:

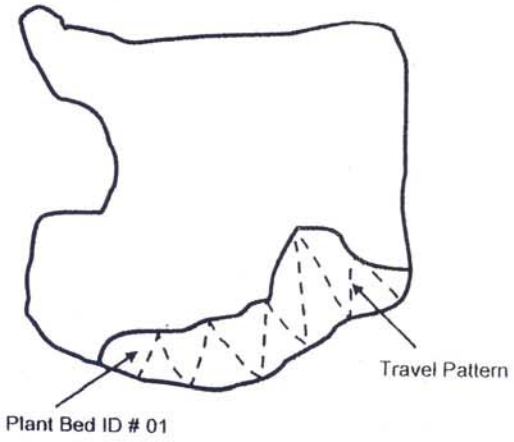
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARA ✓	3			
POIL ✓	3			
POCR3				
MYSP 2 ✓	1			
POGR ✓	3			
PORI				
UTMA ✓	2			
NAFL ✓	3			
POPR 5				
MYVE				
POPE6 ✓	2			
POZO ✓	2			
CEDE				
POAM ✓	3			
SCSP. ✓	2			
LYSA	1			
NYTU ✓	3			
SA SP. ✓	2			
ARVM				
NULU ✓	2			
TYLA ✓	2			
TYAN				

FA P1
VAAM ✓ 1
OCH ✓ 2
SE. IRIS ✓ 2 (IRVI)
SWAMP VOSE ✓ 1
APEX SP. 4
✓ 1

Individual Plant Bed Survey



Comments:

SECCH1 7'
CLOUDY & WINDY
VERY LITTLE MYSP THIS BED - MOSTLY SHALLOW - DARK & WINDY CONDITIONS - NO MYVE SEEN

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.

DATE: 8/3/06

SITE INFORMATION

Plant Bed ID: CH2

Waterbody Name: LAKE PLEASANT

Bed Size: .63

Substrate: 3

Waterbody ID:

Marl? 0

Total # of Species 35 4E

High Organic? 0

Canopy Abundance at Site

S:	N:	F:	E:

SITE COORDINATES

Center of the Bed

Latitude:

Longitude:

Max. Lakeward Extent of Bed

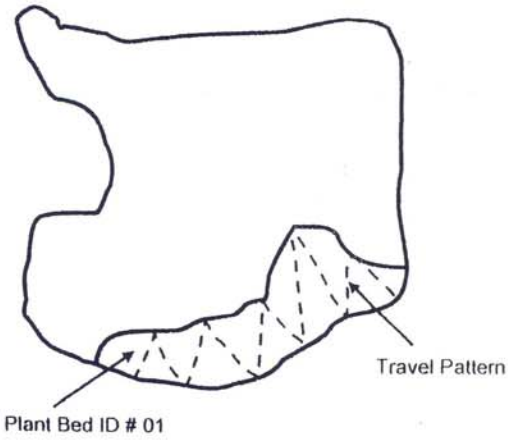
Latitude:

Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CHARL 2				
POPU 1				
POIL				
POCR3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
LOCAL 1				
SCSP.	1			
LYSA				
NYTU	1			
SA SP.	1			
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/3/06

SITE INFORMATION

Plant Bed ID: CH3
Bed Size: 77
Substrate: 3
Marl? 0
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species

Canopy Abundance at Site

S:	N:	F:	E:
			2

SITE COORDINATES

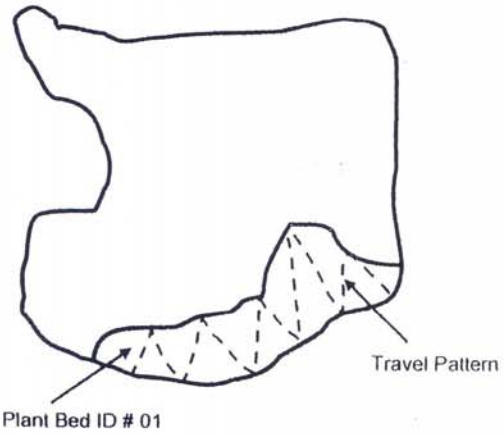
Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? ARV	3			
POIL V	2			
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL				
POPR 5				
MY VE				
POPE 6				
POZO				
CEDE				
POAM				
POCA V — SC SP. V 1				
LYSA				
NYTU V 2				
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: CH 4
Bed Size: .88
Substrate: 2
Marl? 0
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species 35 4E

CanopyAbundance at Site

S: N: F: E:

SITE COORDINATES

Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

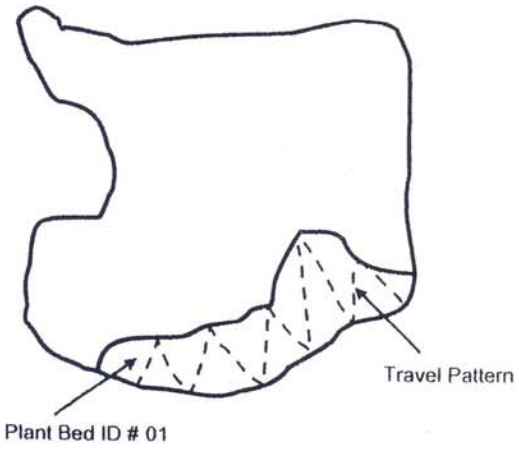
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR ✓	3			
POIL				
POCR 3				
MYSP 2				
POGR				
PORI				
UTMA				
NAFL ✓	4			
POPR 5				
MYVE				
POPE 6				
POZO				
CEDE				
POAM				
SC SP. ✓	1			
LYSA ✓	1			
NYTU ✓	1			
SA SP. ✓	1			
ARVM				
NULU				
TYLA				
TYAN				

IAAM ~ 2

POCO ~ 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page __ of __

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: CH5
Bed Size: .46
Substrate: 3
Marl? 0
High Organic? 0

Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species IN 25 5E

Canopy Abundance at Site: S: N: F: E: 3

SITE COORDINATES

Center of the Bed
Latitude:
Longitude:

Max. Lakeward Extent of Bed
Latitude:
Longitude:

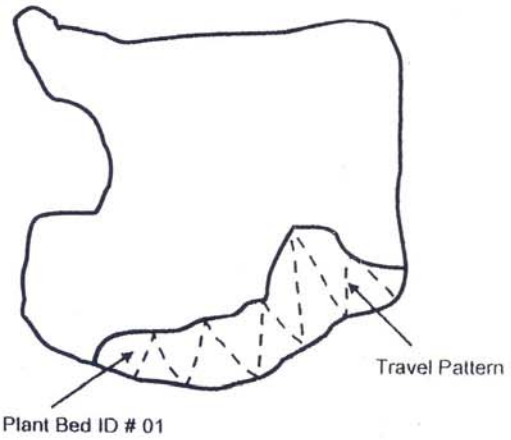
SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ?AR ✓	4			
POIL				
POCR3				
MYSP 2				
POGR				
PORI				
UTMA ✓ 1	1			
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP. ✓	1			
LYSA				
NYTU ✓ 3	3			
SA SP.				
ARVM				
NULU				
TYLA ✓ 1	1			
TYAN				

LEMNA 1

POCO ✓ 2
CA SP ✓ 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/15/06

SITE INFORMATION

Plant Bed ID: CH6
Bed Size: .65
Substrate: 3
Marl? 0
High Organic? 0
Waterbody Name: LAKE PLEASANT
Waterbody ID:
Total # of Species 15 2E
Canopy Abundance at Site: S: 1 N: F: E: 1

SITE COORDINATES

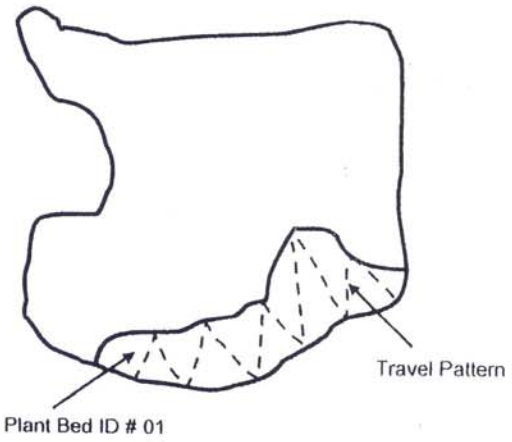
Center of the Bed
Latitude:
Longitude:
Max. Lakeward Extent of Bed
Latitude:
Longitude:

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH ? AR				
POIL ✓	3			
POCR3				
MYSP 2				
POGR ✓	2			
POR1 ✓	1			
UTMA				
NAFL ✓	3			
POPR 5				
MY VE				
POPE6 ✓	2			
POZO				
CEDE				
POAM				
SC SP. ✓	1			
LYSA				
NYTU ✓	1			
SA SP.				
ARVM				
NULU				
TYLA				
TYAN				

IAAMC 1
POPU ✓ 1

Individual Plant Bed Survey



Comments:

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl
1 = Present
0 = absent

High Organic
1 = Present
0 = absent

Overall Surface Cover
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submersed

Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspe
2 = Genus suspected
3 = Unknown

Voucher:
0 = Not Taken
1 = Taken, not varified
2 = Taken, varifie

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Appendix C Tier II Data Sheets 8/06

APPENDIX A

417 ACRES OLIGOTROPHIC 80 SITES

0-5 19
6-10 18
[illegible]-15 [illegible]7
16-20 16
2[illegible]-25 10

Submersed Aquatic Plant Survey Form

Page of 11

WATER BODY NAME	LK PLEASANT	SECCHI	7'
COUNTY	STEUBEN	MAX PLANT DEPTH	
DATE	8/15/06	WEATHER	SUNNY
CREW LEADER	SB	COMMENTS	
RECORDER	SB		

Rake score (1, 3, 5), observed only (9), algae present (p)

Use acronyms for species, V1, V2...for voucher codes

Note

Species Code

Site	Latitude	Longitude	Depth	ZONE ~~All~~	CHAR	POIL	PCGR	NAFL	MYSP	SPINY	PDAR	PCRI	UTMA	VAAM	POPE
1	41°45.29'	85°4.68	3	0-5	3										
2	.34	.73	6	6-10	1			1							
3	.37	.83	6	6-10	3	1		1		1					
4	.43	.83	1	0-5	1										
5	.37	.91	7	6-10	1	1		1							
6	.32	.95	7	6-10	3	1		1							
7	.31	5.08	9	6-10	1					1					
8	.42	5.10	5	0-5	1			1							
9	.44	.18	4.5	0-5	5	1	1	1							
10	.40 ~~.38~~	.18 ~~.20~~	21	2[illegible]-25											
11	.45	.25	7	6-10	3		1	1					1		
12	.44	.28	24	20-25											
13	45.54	.30	14	11-15	5					5					
14	.57	.34	4	0-5	3		1								
15	.55	.42	13	11-15	5										
16	.56	.46	6	6-10	1	3	1	3							1
17	.54	.52	17	16-20	3		1								
18	.52	.57	19	16-20											
19	.48	.62	23.5	20-25						1					
20	.46	.69	6.5	6-10	3	5				3				3	
21	.45	.75	21	21-25	3										
22	.50	.78	1.5	0-5	1		1			1					
23	.47	.82	6	6-10	3		1	1							
24	.48	.89	7	6-10	3			1							
25	.45	.86	25	21-25											
26	.45	.96	22	21-25	1										
27	.48	6.05	19	16-20	5										
28	.51	.13	6	6-10	5	5				1					
29	.44	.14	14	11-15	5										
30	.43	.18	7	6-10	5	5				3	1	+		1	1
31	.46	.26	4.5	0-5	1	1		1							
32	.54	.34	14		5	1		1							

Other plant species observed at lake

~~GET DEPTH?~~

IPHIL
NICELY
CELY@BOSECLAW.COM

APPENDIX A

417 ACRES OLIGOTROPHIC 80 SITES

0-5 19
6-10 18
11-15 17
16-20 16
21-25 10

Submersed Aquatic Plant Survey Form

WATER BODY NAME LK PLEASANT
COUNTY STEUBEN
DATE 8/15/06
CREW LEADER SB
RECORDER SB

SECCHI
MAX PLANT DEPTH
WEATHER SUNNY
COMMENTS

Rake score (1, 3, 5), observed only (9), algae present (p)
Use acronyms for species, V1, V2...for voucher codes

Note

Species Code

Site	Latitude	Longitude	Depth	ZONE	CH?AR	POIL	POGR	NAFL	MYSP	SPINY	PDAR	PORI	VTMA	VAAM	POPE	CSD
33	41°45.64	85°6.40	3	0-5												
34	.73	.52	3	0-5	1											1
35	.72	.54	9.5	6-10									1			5
36	.41	.32	3.5	0-5	3	1							1			
37	.40	.33	3	0-5	3	1		1								
38	.58	.21	5	0-5												
39	.90	.15	14	16-20	1											
40	.29	.18	8	6-10		1							1			
41	.20	.19	8	6-10												
42	.34	.14	3	0-5	5	1										
43	.38	.10	9	6-10	5	1				1						
44	41.42	.09	11	11-15	5	5		1		1						
45	.44	.02	15	11-15	5											
46	.46	5.98	21	20-25												
47	.40	.98	6	6-10	1	1		1								
48	.35	6.02	2	0-5	1		+	1								
49	.33	5.96	3	0-5	1			1								
50	.37	5.92	10	6-10	5	5	1			1		3			3 1	
51	.38	.87	18	16-20	1											
52	.39	.83	21	20-25	1											
53	.38	.78	7	6-10	3	1	3	1						1		
54	.34	.73	4	0-5	5	3		3						1		
55	.34	.66	5	0-5	5	1	3	1				5		3	1	
56	.36	.58	22.5	21-25												
57	.34	.55	18	16-20	1											
58	.28	.47	11	11-15						5	3			5		
59	.25	.47	3	0-5	3	1	1	1								
60	.23	.43	3	0-5	1					1						
61	.29	.40	6	6-10	5	1				1			1			
62	.35	.38	6.5	6-10	3	3				1						
63	.39	.59	16	16-20	1											
64	.37	.30	13	11-15	5											

Other plant species observed at lake

417 ACRES OLIGOTROPHIC 80 SITES

APPENDIX A

0-5 19 28
6-10 18 23
11-15 17 10 (1) (3)
16-20 16 8 (5)
20-25 10 10

Submersed Aquatic Plant Survey Form

Page ___ of ___

WATER BODY NAME LK PLEASANT
COUNTY STEUBEN
DATE 8/15/06
CREW LEADER SB
RECORDER SB
SECCHI
MAX PLANT DEPTH
WEATHER SUNNY WEST WIND 10-15
COMMENTS

Rake score (1, 3, 5), observed only (9), algae present (p)
Use acronyms for species, V1, V2...for voucher codes

Site	Latitude	Longitude	Depth	ZONE Alt	CHAR	POIL	POGR	NAFL	MYSP	SPINY	PORR	PORI	UTMA	VAAM	Note
65	41°45.76	85°05.25	22	21-25											
66	.30	.18	17	16-20											
67	.26	.14	14	11-15	1					1					
68	.21	.12	15	11-15	5					1					
69	.19	.05	10.5	11-15	1					5					
70	.21	4.98	6.5	6-10	5			1							
71	.23	.90	6	6-10	5										
72	.20	.30	5	0-5	5	1	1	1					1		
73	.18	.71	2	0-5	1			1							
74	.15	.78	4	0-5	3			1							
75	.13	.90	5	0-5	1										
76	.10	.98	4	0-5	5		1								
77	.08	5.05	3	0-5	1			1							
78	.13	5.09	4	0-5	3			1							
79	.13	.17	4	0-5	1		1	1							
80	.17	.19	5	0-5	1		1	1						1	
81	.32	.28	19	16-20											
82	.38	.13	17	16-20	5					1					
83	.35	.13	16	16-20	1					1					
84	.30	.13	11.5	11-16	5					5					
85	.42	5.21	16	16-20	5										
86	.44	.26	14	11-16	5										
87	.49	.31	18.5	16-20	1										
88	.54	.40	15	11-16	3										
89	.55	.42	16.5	16-20	5										
90	.52	.58	11	11-16		3		1						5	
91	.48	.62	18	16-20	5									1	
92	.38	.67	18.5	16-20	1										
93	.40	.73	18	16-20	1										
94	.40	.77	12	11-15	5										
95	.37	.86	12	11-15	3										
96	.39	.95	11	11-15	5										

Other plant species observed at lake

Appendix D, 2007 Season IDNR Vegetation Permit Application

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)
Approved State Board of Accounts 1987

☐ Whole Lake ☒ Multiple Treatment Areas
Check type of permit

INSTRUCTIONS: Please print or type information

FOR OFFICE USE ONLY
License No
Date Issued
Lake County

Return to

DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Commercial License Clerk
402 West Washington Street, Room W273
Indianapolis, IN 46204

FEE: $5.00

Applicant's Name	Lake Assoc. Name	
Lake Pleasant Cottage Owners Assn.	Lake Pleasant Cottage Owners Assn.	
55 Ln 101 Lake Pleasant		Phone Number: 260-833-4026
City and State: Fremont, IN		ZIP Code: 46737
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code

Lake (One application per lake)	Nearest Town	County
Lake Pleasant	Orland	Steuben

Does water flow into a water supply ☐ Yes ☒ No

Please complete one section for *EACH* treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

Treatment Area # 1	LAT/LONG or UTM's N 41 deg 45' 15.8" W 85 deg 4' 58.3"	
Total acres to be treated 20	Proposed shoreline treatment length (ft) open lk	Perpendicular distance from shoreline (ft) varies
Maximum Depth of Treatment (ft) 15	Expected date(s) of treatment(s) 5/15/07, 7/15/07	

Treatment method: ☒ Chemical ☐ Physical ☐ Biological Control ☐ Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Navigate 2-4-D

Plant survey method: ☐ Rake ☒ Visual ☐ Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Curly-leaf pondweed		5%
Eurasian watermilfoil	X	50%
Illinois pw		10
Flatstem pw		5
Whitestem pw		10
Chara		20

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

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Date Issued
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DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Commercial License Clerk
402 West Washington Street, Room W273
Indianapolis, IN 46204

FEE: $5.00

Applicant's Name	Lake Assoc. Name: Lake Pleasant Cottage Owners Assn.	
		Phone Number
City and State		ZIP Code
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code

Lake (One application per lake)	Nearest Town	County
Lake Pleasant	Orland	Steuben
Does water flow into a water supply		☐ Yes ☒ No

Please complete one section for *EACH* treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

Treatment Area # 2	LAT/LONG or UTM's N 41 deg 45' 20.2" W 85 deg 6' 3.8"		
Total acres to be treated 11	Proposed shoreline treatment length (ft) shoreline/chan	Perpendicular distance from shoreline (ft)	varies
Maximum Depth of Treatment (ft) 5.5	Expected date(s) of treatment(s) 5/15/07, 7/8/07		

Treatment method: ☒ Chemical ☐ Physical ☐ Biological Control ☐ Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control: Navigate 2-4-D

Plant survey method: ☐ Rake ☒ Visual ☐ Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Curly-leaf pondweed		5%
Eurasian watermilfoil	X	50%
Illinois pw		10
Flatstem pw		5
whorled watermilfoil		10
Chara		20

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)
Approved State Board of Accounts 1987

☐ Whole Lake ☒ Multiple Treatment Areas
Check type of permit

INSTRUCTIONS: Please print or type information

FOR OFFICE USE ONLY
License No
Date Issued
Lake County

Return to
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Commercial License Clerk
402 West Washington Street, Room W273
Indianapolis, IN 46204

FEE: $5.00

Applicant's Name	Lake Assoc. Name: Lake Pleasant Cottage Owners Assn.	
		Phone Number
City and State		ZIP Code
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code

Lake (One application per lake)	Nearest Town	County
Lake Pleasant	Orland	Steuben
Does water flow into a water supply		☐ Yes ☒ No

Please complete one section for *EACH* treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

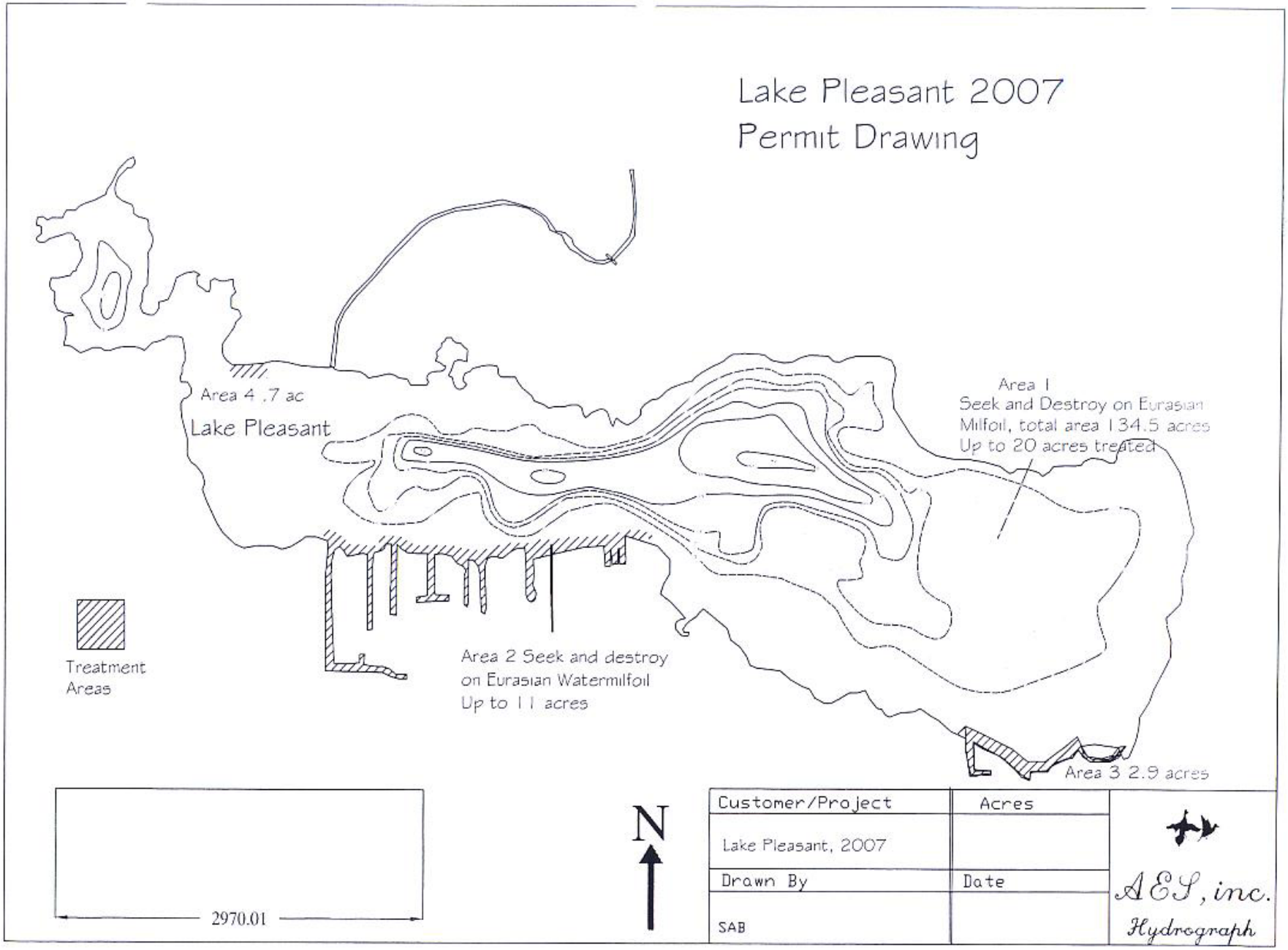
Treatment Area # 3	LAT/LONG or UTM's N 41 deg 45' 3.4" W 85 deg 4' 47.0"		
Total acres to be treated 2.9	Proposed shoreline treatment length (ft) shoreline/chan	Perpendicular distance from shoreline (ft)	60 ft
Maximum Depth of Treatment (ft) 5.5	Expected date(s) of treatment(s) 5/15/07, 7/8/07		

Treatment method: ☒ Chemical ☐ Physical ☐ Biological Control ☐ Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Navigate 2-4-D

Plant survey method: ☐ Rake ☒ Visual ☐ Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Curly-leaf pondweed		5%
Eurasian watermilfoil	X	50%
Illinois pw		10
Flatstem pw		5
Whorled watermilfoil		10
Chara		20


Lake Pleasant 2007
Permit Drawing
Area 4 .7 ac
Lake Pleasant
Area 1
Seek and Destroy on Eurasian
Milfoil, total area 134.5 acres
Up to 20 acres treated
Treatment
Areas
Area 2 Seek and destroy
on Eurasian Watermilfoil
Up to 11 acres
Area 3 2.9 acres
2970.01
N
Customer/Project
Acres
Lake Pleasant, 2007
Drawn By
Date
SAB
AES, inc.
Hydrograph

Appendix E Additional Resources

Calendar of lake management, conferences, classes, and workshops

Lake Pleasant residents can attend the following events to learn more about lake management and converse with other lake associations and lake management professionals regarding plant management programs.

2007
March 30th and 31st, Indiana Lakes Management Society conference. Lake Monroe, Bloomington Indiana. More information is available at www.indianalakes.org or by calling 260-665-8226

April 28, Kinderhook Michigan, Lk George Association/ILMS sponsored Hydrilla workshop. More information is available at www.indianalakes.org or by calling 260-665-8226

October , Several local workshops offered by the Indiana Lakes Management Society, dates to be announced. More information is available at www.indianalakes.org or by calling 260-665-8226

Sources of local, state, and federal funding and information

Funding assistance for watershed wetland and grassland restoration is available from:

Ducks Unlimited
Great Lakes/Atlantic Regional Office
331 Metty Drive, Suite #4
Ann Arbor, MI 48103
734-623-2000

Pheasants Forever, Northeast Indiana Chapter
Habitat Officer, Dave Hurley
1003 County Road 8
Corunna, IN 46730

Other help for watershed improvements can be obtained from:

Indiana Department of Natural Resources
Division of Fish and Wildlife Room W265
402 W. Washington Street
Indianapolis, IN 46204-2739
317-233-5468

USDA Natural Resources Conservation Service
1220 N 200W
Angola, IN 46703

Wood-Land-Lakes RC&D
Peachtree Plaza 200
1220 N 200 W -Ste J
Angola, IN 46703
260-665-3211, Ext. 5